PSD PERMIT APPLICATION

Oglethorpe Power Corporation > Thomas A. Smith Energy Facility

PSD Permit Application
Volume I

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1. EXECUTIVE SUMMARY

Oglethorpe Power Corporation (OPC) owns and operates an electrical power plant in Murray County near Dalton, Georgia, known as the Thomas A. Smith Energy Facility (OPC T.A. Smith). OPC T.A. Smith is a major source under both the Title V operating permit program and the Prevention of Significant Deterioration (PSD) construction permitting program. This facility currently operates under Permit No. 4911-213-0034-V-08-0, effective January 4, 2016, and subsequent amendments issued March 28, 2017 and October 2, 2018. The facility was previously known as the Murray Energy Facility.

OPC T.A. Smith is a natural gas-fired combined-cycle facility presently capable of producing a nominal power output of 1,240 megawatts (MW). The facility operates two power blocks each consisting of two combined cycle combustion turbines (CCCTs) and one steam turbine, referred to as a "2-on-1" configuration. Each CCCT includes a General Electric (GE) 7FA combustion turbine (CT) exhausting to a heat recovery steam generator (HRSG), which generates steam to power the block's steam turbine. Each HRSG has a duct burner (DB) to provide supplementary firing for additional steam generation as needed. The facility also operates two natural gas-fired auxiliary boilers, each with an annual operational limit of 6,000 hours, two diesel-fired backup generators rated at 704 horsepower (hp) each, and one diesel-fired emergency firewater pump rated at 265 hp. The backup generators and emergency firewater pump are limited to 500 hours per year of operation per engine.

To minimize the formation of oxides of nitrogen (NO_X), each combustion turbine is equipped with dry low NO_X combustors, each duct burner with low NO_X burners, and each auxiliary boiler with low NO_X burners and flue gas recirculation (FGR). In addition, each combustion turbine and associated duct burner stack is equipped with a selective catalytic reduction (SCR) system for control of NO_X emissions.

OPC is proposing two projects that involve modifications to the CCCT systems (i.e., each CT with HRSG and DB). Only one of these proposed projects, the Advanced Gas Path Project III (AGP Project III), is anticipated to result in an increase in facility emissions. The AGP Project III will result in an increase in emissions exceeding the PSD Significant Emission Rates (SERs) for filterable particulate matter (PM), particulate matter with an aerodynamic diameter of 10 microns (PM_{10}), particulate matter with an aerodynamic diameter of 2.5 microns ($PM_{2.5}$), NO_X, and greenhouse gases (GHG) in terms of carbon dioxide equivalents (CO_2e). Therefore, this permitting action is subject to PSD permitting for these pollutants. The application package contains the necessary state air construction and operating permit application for the proposed projects, included in two (2) separate application volumes. This Volume I of the application details the required emissions analyses, regulatory review, and control technology analyses. Volume II of the application package includes all the required air quality assessments necessary as part of this PSD permit application.

1.1. PROPOSED PROJECT DESCRIPTION

OPC is considering making control system changes that would allow OPC T.A. Smith to increase the capacity of each block by approximately 28.6 MW in the summer and 31.0 MW in the winter (Block 1 being CCCT1 and CCCT2 and steam turbine, and Block 2 being CCCT3 and CCCT4 and steam turbine), referred to as the AGP Project III. These control changes would result in an associated increase in maximum heat inputs and maximum hourly rate of emissions when the duct burners are used at their full capability. OPC is also considering installation of new turbine components and controls to allow sustained operations at lower operating loads, referred to as the Minimum Load Project. Currently, OPC T.A. Smith's Title V permit only allows turbine operation below 73.6 MW during periods of startup, shutdown, or special testing.[1] This value was selected based

1 Permit Condition 3.3.7

on GE-provided data indicating an increase in NO_X and CO emissions concentrations at lower loads potentially exceeding the facility's emission limits for those pollutants. The Minimum Load Project, if implemented, would allow the gas turbines to operate at a lower minimum load while continuing to maintain NO_X and CO emissions concentrations in compliance with the facility's permitted emission limits. More detail regarding the proposed projects is provided in Section 2.2 of this report.

1.2. PERMITTING AND REGULATORY REQUIREMENTS

OPC is submitting this construction and operating permit application, in accordance with the PSD permitting requirements, to request authorization to modify and operate the site's combined cycle combustion turbine systems and associated HRSGs with duct burners. Since OPC T.A. Smith is a major source under the PSD permitting program, emission increases from the proposed projects must be evaluated and compared to the significant emission rates (SERs) for regulated pollutants under the PSD program. OPC has evaluated emissions increases of carbon monoxide (CO), NO_X, PM, PM_{10}, $PM_{2.5}$, CO_2e, sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), and volatile organic compounds (VOC) resulting from the proposed projects for comparison to their respective PSD SERs to determine whether PSD permitting is required, as shown in Table 1-1.[2]

Table 1-1. Proposed Project Emissions Increases

Pollutant	Project Emissions Increase (tpy)	NSR Major Modification Threshold (tpy)	NSR Permitting Required?
SO_2	14.52	40	No
NO_X	127.50	40	Yes
CO	47.49	100	No
PM	153.32	25	Yes
Total PM_{10}	153.32	15	Yes
Total $PM_{2.5}$	153.32	10	Yes
VOC	36.02	40	No
CO_2e	2,897,635	75,000	Yes
H_2SO_4	2.43	7	No

Since the combined project emissions increases of filterable PM, total PM_{10}, total $PM_{2.5}$, NO_X, and CO_2e exceed their respective SERs, the proposed project is required to undergo PSD review for each of those pollutants. Emission calculations are described in Section 3 of this application, and PSD permitting requirements are detailed in Section 4.1.

OPC is submitting this construction and operating permit application package in accordance with all federal and state requirements. The proposed project will be subject to federal New Source Performance Standards (NSPS) and the Georgia Rules for Air Quality Control (GRAQC). Applicability of these programs is discussed in Section 4 of this application.

[2] AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, lists the lead (Pb) emission factor for natural gas turbines as ND (no detect); therefore, Pb emissions increases for the proposed projects were not evaluated.

1.3. BACT DETERMINATION

OPC performed an analysis of Best Available Control Technology (BACT) for each of the PSD-regulated pollutants that exceeded their SERs (filterable PM, total PM_{10}, total $PM_{2.5}$, NO_X, and CO_2e), following the "top-down" approach suggested by U.S. EPA. The top-down process begins by identifying all potential control technologies for the pollutant in question and making a determination if those control options are technically feasible for the specific process. The approach then involves ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or "top" control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. Where the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

Based on the BACT review, OPC proposes the technology and limits presented in Table 1-2 as BACT for the proposed emission units. The detailed BACT analysis is presented in Section 5 of this application.

Table 1-2. Summary of Proposed BACT Limits

Unit	Pollutant	Selected BACT	Emission / Operating Limit	Compliance Method
Combustion Turbine and HRSG Duct Burner System	Filterable PM/Total PM_{10}/Total $PM_{2.5}$	Good Combustion and Operating Practices and Low Sulfur Fuels	19.5 lb/hr	Performance Test
	NO_X	SCR, DLN Combustors, and Good Combustion Practices	3.0 ppmvd at 15% O_2 on a 3-hour rolling average basis 279 tpy per rolling 12-months (each Block containing 2 CCCTs) 1,153 lb/day (each CCCT)	CEMS
	GHGs	Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices	1,270,090 tpy CO_2e per rolling 12-months (each CCCT)	Records of Fuel Usage

1.4. APPLICATION CONTENTS

Volume I of this permit application is organized as follows:

- Section 2 contains a description of the proposed projects;
- Section 3 summarizes emissions calculation methodologies and assesses PSD applicability;
- Section 4 details the regulatory applicability analysis for the proposed projects;
- Section 5 contains the required BACT assessment;
- Appendix A includes an area map, site plot plan and simplified process flow diagram;
- Appendix B includes detailed emission calculations;

- Appendix C includes the applicable Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database tables;
- Appendix D contains the Georgia Environmental Protection Division (EPD) SIP construction permit application forms; and
- Appendix E contains reference documentation for the Minimum Load Project

OPC is proposing two distinct projects: (1) the AGP Project III and (2) the Minimum Load Project. Each is described in the following sections.

2.1. ADVANCED GAS PATH PROJECTS DESCRIPTION

The AGP Project III is the third in a series of three AGP projects. Two have been completed by OPC (after each respectively receiving confirmation from EPD that a permit change was not required). The third, AGP Project III, is currently under review by OPC for possible completion. OPC's decision to implement the first two AGP projects was independent of, and not conditioned on the later decision to pursue AGP Project III. OPC believes that AGP Project III is separate under PSD regulations[3] but chose an aggregated assessment of all three projects for this permit application.

In the first project (AGP Project I), GE installed the AGP components on the combustion turbines to extend the maintenance interval without creating any increase in firing temperature or hourly emissions. In the second project (AGP Project II), GE adjusted the control system to use more of the capabilities of the AGP components (which caused some increase in the maximum firing temperature and maximum heat input of the combustion turbines only) while creating corresponding decreases in the maximum heat inputs for the duct burners associated with each combustion turbine's HRSG. As a result, there was no increase in the maximum heat input of the overall "affected facility" (which under the NSPS for *Stationary Combustion Turbines*, 40 CFR 60 Subpart KKKK includes the turbine and duct burner) and no increase in maximum hourly emissions from the combined stacks. These control system changes limited the output capacity of each CCCT to its pre-existing capacity.

Before implementing AGP Projects I and II, OPC submitted Title V off-permit change letters to notify Georgia EPD of its plans. The first notice was submitted on September 24, 2014 and included a copy of the results of OPC's PSD analysis for Project I. On October 3, 2014, EPD responded in a letter agreeing that "no permit change is needed" for the Project. Before implementing Project II, OPC submitted a second Title V off-permit change letter on January 26, 2015. EPD responded in a letter on February 11, 2015 agreeing that a permit change was still not necessary for AGP Project II.

GE completed AGP Project I in October 2014 for CCCT3 and CCCT4 and in April 2015 for CCCT1 and CCCT2. GE completed AGP Project II in April 2015 for all four CCCTs. Since that time, OPC has conducted studies and consulted with local utilities regarding the capacity of the existing grid infrastructure to accept increased power output from OPC T.A. Smith. As a result of those evaluations, OPC is now considering implementing AGP Project III. Additional changes to the control system are needed before an increase in maximum hourly emissions or maximum capacity can be realized.

Under AGP Project III, OPC is considering additional control changes that would allow OPC to utilize the maximum capability of the AGP components, via the duct burners. If implemented, this change would increase the capacity of each block by approximately 28.6 MW in the summer and 31.0 MW in the winter (Block 1 being CCCT1 and CCCT2 and steam turbine, and Block 2 being CCCT3 and CCCT4 and steam turbine). The increased capacity would lower the cost per MW to the 38 members of OPC, a not-for-profit generation cooperative. These additional control changes would result in an associated increase in maximum heat inputs and maximum hourly

[3] Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR): Aggregation; Reconsideration, Final action; lifting of administrative stay and announcement of effective date, 83 Fed. Reg. 57,324 (November 15, 2018).

rate of emissions when the duct burners are used at their full capability. Implementation of AGP Project III would not increase the noise emissions from OPC T.A. Smith above historical levels, and does not require any changes in the facility's gas supply infrastructure.

2.2. MINIMUM LOAD PROJECT DESCRIPTION

OPC is also considering installation of new turbine components and software controls to replace selected combustion equipment and connection accessories to allow sustained operations at lower operating loads, referred to as the Minimum Load Project. The Minimum Load Project would include replacements to the combustion equipment (potentially including end covers, fuel nozzles, combustion casings, cap assembly, liners, transition pieces, flow sleeves, and X-Fire tubes) and to the connection accessories (potentially including flex hoses/pig tails, ring manifolds, cooling and sealing air piping, and gas control valves). Currently, OPC T.A. Smith's Title V permit only allows turbine operation below 73.6 MW during periods of startup, shutdown, or special testing.[4] This value was selected based on GE-provided data indicating an increase in NO_X and CO emissions concentrations at lower loads potentially exceeding the facility's emission limits for those pollutants. The Minimum Load Project, if implemented, would allow the gas turbines to operate at a lower minimum load while continuing to maintain NO_X and CO emissions concentrations in compliance with the facility's permitted emission limits. Specifically, data provided by GE for the Minimum Load Project, included in Appendix E, show that these upgrades would allow steady-state operations of the turbines at loads of approximately 49 MW, with some variations for ambient temperatures, while still achieving continuous compliance. The proposed Minimum Load Project would have no impact on the capacity of the turbines.

While the proposed Minimum Load Project is a distinct project from the proposed AGP Project III, OPC is requesting approval to implement both projects as part of this permit application. In particular, OPC requests EPD remove the condition specifying an allowable minimum steady state operating load from OPC T.A. Smith's Title V permit. Compliance with the NO_X and CO emission limits will continue to be demonstrated through the use of the facility's existing continuous emissions monitoring systems (CEMS).

[4] Permit Condition 3.3.7

3. EMISSIONS CALCULATION METHODOLOGY

This section addresses the methodology used to quantify the emissions from the proposed projects and assesses federal New Source Review (NSR) permitting applicability. Emissions from the proposed projects will include CO, NO_X, SO_2, VOC, PM, PM_{10}, $PM_{2.5}$, lead (Pb), H_2SO_4, GHG in the form of CO_2e, and hazardous air pollutants (HAP). These emissions occur as a result of natural gas combustion in the combustion turbines and duct burners. Detailed emission calculations are presented in Appendix B.

3.1. NSR PERMITTING EVALUATION METHODOLOGY

The NSR permitting program generally requires that a source obtain a permit prior to construction of any project at an industrial facility if the proposed project results in the potential to emit air pollution in excess of certain threshold levels. The NSR program is comprised of two elements: nonattainment NSR (NNSR) and PSD. The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area the facility is located in is classified as "nonattainment" with the National Ambient Air Quality Standards (NAAQS) for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as "attainment" or "unclassifiable" for the NAAQS. OPC T.A. Smith is located in Murray County, which is presently designated as "attainment" or "unclassifiable" for all criteria pollutants. As such, PSD permitting is potentially applicable to the proposed projects.

The following sections discuss the methodology used in the project emissions increase evaluation conducted to assess PSD applicability under the NSR program. For all PSD-regulated pollutants other than CO_2e, PSD permitting is required if the emissions increase of a specific pollutant exceeds that pollutant's PSD SER. For CO_2e, PSD permitting is only required if the emissions increase exceeds the SER for CO_2e and the project is already undergoing PSD permitting for at least one other PSD-regulated pollutant.[5] As the facility is classified as a major source for PSD, if the proposed projects meet the definition of a *major modification*, then the full PSD permitting requirements apply.

3.2. DEFINING EXISTING VERSUS NEW EMISSION UNITS

For purposes of calculating project emissions increases, different calculation methodologies are used for existing and new units; therefore, it is important to clarify whether a source affected by the proposed projects are considered new or existing emission units.

40 CFR 52.21(b)(7)(i) and (ii) define new unit and existing units, and are incorporated by reference in the GRAQC:

> (i) *A new emissions unit is any emissions unit that is (or will be) newly constructed and that has existed for less than 2 years from the date such emissions unit first operated.*
>
> (ii) *An existing emissions unit is any unit that does not meet the requirements in paragraph (b)(7)(i) of this section. A replacement unit, as defined in paragraph (b)(33) of this section, is an existing emissions unit.*

[5] 40 CFR 52.21(b)(49)(iii) as incorporated by reference in the GRAQC

As the emission units at OPC T.A. Smith have operated for more than two years, the proposed projects involve physical or operational changes to existing emission units only: the combustion turbines and duct burners operated at OPC T.A. Smith. There are no new emission units proposed for installation as part of these projects.

3.3. ANNUAL EMISSION INCREASE CALCULATION METHODOLOGY

As OPC T.A. Smith is classified as a major source for PSD, if the proposed projects meet the definition of a *major modification*, then the full PSD permitting requirements apply. *Major modification* is defined by 40 CFR 52.21(b)(2)(i):

> *"Major Modification" means any physical change in or change in the method of operation of a major stationary source that would result in a significant emission increase … of a regulated NSR pollutant … and a significant net emissions increase of that pollutant …*

Certain exemptions to the major modification definition exist that, if applicable, means a project does not require an emission increase assessment. The proposed projects do not qualify for any of the established exemptions.

The project emissions have been analyzed using the current NSR Reform methodology to determine if a significant emissions increase will occur. *Net emissions increase* (NEI) is defined by 40 CFR 52.21(b)(3)(i):

> *"Net Emissions Increase" means, with respect to any regulated NSR pollutant … the amount by which the sum of the following exceeds zero:*
>
> *(a) The increase in emissions … as calculated pursuant to paragraph (a)(2)(iv) [for existing units, calculated by actual-to-projected actual*[6] *or actual-to-potential; for new units, calculated by actual-to-potential]*[7]
>
> *(b) Any other increases or decreases in actual emissions…that are contemporaneous with the particular change and are otherwise creditable. Baseline emissions for calculating increases and decreases…shall be determined as provided…*

The first step (1) is commonly referred to as the "project emission increases" as it has historically accounted only for emissions related to the proposed project itself. If the emission increases estimated per step (1) exceed the major modification thresholds, then the applicant may move to step (2), commonly referred to as the 5-year netting analysis. The netting analysis includes all projects for which emission increases or decreases (e.g., equipment shutdown) occurred. If the resulting net emission increases exceed the major modification threshold, then NSR permitting is required. OPC has evaluated the project emissions increase for the proposed projects (i.e., Step 1) using the methodologies outlined in the following sections. An evaluation of the net emissions increase (i.e., Step 2) was not conducted as the facility has no other emissions increases or decreases during the contemporaneous period for the proposed projects.

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[6] 40 CFR 52.21(a)(2)(iv)(c), *Actual-to-projected-actual applicability test for projects that only involve existing emissions units*, states: *A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions … and the baseline actual emissions … equals or exceeds the significant amount for that pollutant …*

[7] 40 CFR 52.21(a)(2)(iv)(d), *Actual-to-potential test for projects that only involve construction of new emissions units*, states: *A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit … and the baseline actual emissions … equals or exceeds the significant amount for that pollutant …*

While the prior quotations only reference three components of the NEI calculation (actual, projected actual, and potential emissions), there are actually five calculated components, with the additional components being (1) a subset of the definition for *projected actual* and (2) additional associated emission unit increases:

- Potential emissions
- Baseline actual emissions
- Projected actual emissions
- "Could have accommodated" emissions exclusion (commonly called the demand growth exclusion)
- Additional associated emission unit increases

3.3.1. Potential Emissions

Potential emissions are defined by 40 CFR 52.21(b)(4) where the potential to emit:

> *…means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable…*

While potential emission estimates have not been relied upon for purposes of the PSD project emission increase analysis, potential emissions are detailed for purposes of the PSD air quality analyses and documentation of the facility estimated potential emissions following the projects.

3.3.2. Baseline Actual Emissions

Baseline actual emissions are defined in GRAQC 391-3-1-.02(7)(a)2(i)(I):

> *For any existing electric utility steam generating unit, baseline actual emissions means the average rate, in tons per year, at which the unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 5-year period immediately preceding when the owner or operator begins actual construction of the project. …*

3.3.3. Projected Actual Emissions

Projected actual emissions are defined by GRAQC 391-3-1-.02(7)(a)2(ii)(I):

> *"Projected actual emissions" means the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated NSR pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that regulated NSR pollutant and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the major stationary source.*

For units in which the proposed projects would not change the potential to emit or the design capacity, projected actual emissions would be for the following five years after authorization of the proposed projects.

In determining projected actual emissions, following GRAQC 391-3-1-.02(7)(a)2(ii)(II)I, the source:

Shall consider all relevant information, including but not limited to, historical operational data, the company's own representations, the company's expected business activity and the company's highest projections of business activity, the company's filings with the State or Federal regulatory authorities, and compliance plans under the approved State Implementation Plan.

In addition, when calculating projected actual emissions, OPC T.A. Smith can exclude emissions that could have been accommodated prior to the projects and that are unrelated to the projects, pursuant to GRAQC 391-3-1-.02(7)(a)2(ii)(II)III.

3.3.4. Could Have Accommodated Emissions

An exclusion, per GRAQC 391-3-1-.02(7)(a)2(ii)(II)III, is included in the definition of projected actual emissions and is a value that is subtracted from the projected actual emissions for existing emission units:

May exclude, in calculating any increase in emissions that results from the particular project, [1] that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions under subparagraph (7)(a)2.(i) of this rule and that is also [2] unrelated to the particular project, including any [3] increased utilization due to product demand growth (the increase in emissions that may be excluded under this subparagraph shall hereinafter be referred to as "demand growth emissions")... [emphasis added, numbers 1, 2, 3 added]

Thus, projected emissions increases are exempted when (1) a unit could have accommodated the emissions during the baseline 24-month period, (2) the increases do not result from the particular project, and (3) the increases are related to increased product demand.

3.3.5. Additional Associated Emission Unit Increases

In addition to the emission increases from new or modified units, emission increases from associated emission units that may realize an increase in emissions due to a project must be included in the assessment of the project emissions increases. OPC T.A. Smith does not anticipate emission increases from other emission units at the facility (e.g., auxiliary boilers and cooling towers). The facility is anticipated to operate at a high capacity factor in the future, meaning a potential decrease in the anticipated frequency of startup and shutdown events at the facility (when the auxiliary boilers would be potentially utilized). Therefore, no associated unit emission increases are included in the analysis for the auxiliary boilers. There is no anticipated increase in circulating water flow through the facility cooling towers associated with these projects, which would potentially lead to any associated emissions increases from the cooling towers. While an increase in the overall water usage rate for the cooling towers is anticipated due to the higher heat load following the projects, resulting in increased water evaporation from the system, the circulating water flow rate and, therefore, the drift loss will remain unchanged. As such, no associated emissions increases are included in this analysis for the cooling towers.

3.4. BASELINE ACTUAL EMISSIONS

The appropriate baseline period to use for baseline actual emissions for this evaluation was discussed in consultation with Georgia EPD, through meetings held in September through November 2018. While the most recent 5 year lookback period would be more representative of normal source operation, and of future source operation, Georgia EPD requested a 5 year look back period for baseline actual emissions from AGP Project I (which occurred in 2014). This is highly conservative, since the overall facility utilization was much lower prior

to 2014 than in recent years as a result of significant decreases in natural gas prices since 2014, leading to lower facility wide actual emissions for a baseline period occurring prior to 2014.

Accordingly, a period of April 2011 to March 2013 was selected as the 2 year (consecutive 24-month) baseline period for all pollutants. Baseline actual emissions data utilized for the NSR analysis for each combined cycle combustion unit can be found in Appendix B.

3.5. PROJECTED ACTUAL EMISSIONS

Projected actual emissions for the modified equipment were determined for use in the NSR analysis, based on the highest projected level of actual annual utilization of the modified combustion turbine systems following AGP Project III and the Minimum Load Project (at 85.4 x 10^6 MMBtu/yr), and estimated actual emission factors derived from facility operations, as summarized in Table 3-1.

Table 3-1. Criteria Pollutant Projected Actual Emission Factors for CCCT Units

Pollutant	Turbine System	
	Emission Factor	Unit
NO_X[1]	7.24 E-03	lb/MMBtu
CO[1]	1.4 E-02	lb/MMBtu
VOC[2]	1.48 E-03	lb/MMBtu
Total $PM/PM_{10}/PM_{2.5}$[3]	6.3 E-03	lb/MMBtu
SO_2[4]	6 E-04	lb/MMBtu
H_2SO_4[5]	1 E-04	lb/MMBtu

[1] NO_X and CO lb/MMBtu emission factors derived based on available facility CEMs data and recent facility operations.
[2] VOC emissions factor based on historic facility compliance testing data from 2002.
[3] PM emissions based on historic facility stack testing data from 2002 for filterable emissions (3.4 E-03 lb/MMBtu), and engineering estimate of condensable emissions giving total $PM_{10}/PM_{2.5}$ emissions of 6.3 E-03 lb/MMBtu.
[4] Part 75 default emission factor for SO_2 for pipeline natural gas combustion, as reported to the EPA Clean Air Markets program for the facility.
[5] Engineering Estimate based on data provided by GE.

Projected actual GHG emissions are calculated based on the defined CO_2 emission factor per 40 CFR 75 (Acid Rain Program) and the global warming potentials and emission factors per the GHG Mandatory Reporting Rule (MRR) promulgated per 40 CFR 98 Subparts A and C, respectively.

3.6. COULD HAVE ACCOMMODATED EMISSIONS

The "could have accommodated" emissions for these projects are based on consideration of the "Georgia Pacific memo" and subsequent correspondence with U.S. EPA, indicating that a maximum 30-day period can be utilized to demonstrate emissions that "could have been accommodated" by a source during the respective baseline period.[8] However, since these projects involve modification of combustion turbine units, which will be evaluated in the emissions baseline and considered for "could have accommodated" emissions, additional

[8] https://www.epa.gov/nsr/response-georgia-pacific-use-demand-growth-exclusion-projected-actual-emissions

conservative assumptions were applied to the 30-day maximum period technique as outlined in the referenced Georgia Pacific memo.

Specifically, since combustion turbine unit emissions can vary significantly by season, application of an additional seasonal variation (as discussed in the "Georgia Pacific memo") was relied upon for this analysis. The maximum 30-day period from each season was evaluated, and used to evaluate total emissions for the entire seasonal period. Seasonal breakdowns were evaluated as follows;

Spring: March – May

Summer: June – August

Fall: September – November

Winter: December – February

This methodology was conservative, as it was not assuming a maximum 30 day period from winter (when emissions from a combustion turbine can be at their highest) could occur throughout the entire annual period. Emissions that were excluded using this methodology are also necessarily unrelated to the proposed projects as they are based on existing capacity and actual data from the selected baseline period.

Additional data regarding the "could have been accommodated" analysis is included in Appendix B.

3.7. NSR EMISSIONS INCREASE SUMMARY

Table 3-2 shows the total emissions increase of the proposed projects compared to the PSD major modification thresholds. Detailed emission calculations can be found in Appendix B of this application report.

Table 3-2. Project Emissions Increase

Pollutant	Baseline Actual Emissions (tpy)	Projected Actual Emissions (tpy)	Emissions that Could Have Been Accommodated (tpy)	Demand Growth Emissions (tpy)	Baseline to Projected Actual Emissions Increase (tpy)	NSR Major Modification Threshold (tpy)	NSR Permitting Required?
SO_2	8.10	25.62	11.10	3.00	14.52	40	No
NO_X	146.20	309.30	181.80	35.60	127.50	40	Yes
CO	304.05	597.80	550.31	246.26	47.49	100	No
PM	86.00	269.01	115.69	29.69	153.32	25	Yes
Total PM_{10}	86.00	269.01	115.69	29.69	153.32	15	Yes
Total $PM_{2.5}$	86.00	269.01	115.69	29.69	153.32	10	Yes
VOC	20.20	63.20	27.18	6.97	36.02	40	No
CO_2e	1,636,005	5,080,359	2,182,724	546,718	2,897,635	75,000	Yes
H_2SO_4	1.37	4.27	1.84	0.47	2.43	7	No

3.8. POTENTIAL EMISSIONS ESTIMATE

The following sections discuss the methodology used to calculate the potential emissions for each emission unit at the facility. While only the emissions from each combustion turbine systems (including each HRSG and duct

burner) are necessary for purposes of the NSR project emission increase assessment, the potential emissions of other facility emission units is detailed herein to support the air dispersion modeling analyses detailed in Volume II of this application package.

3.8.1. Combined Cycle Combustion Turbines

The potential emissions for each CCCT (i.e., combustion turbine with HRSG and duct burner, discharging to a common stack) are determined on a pollutant-by-pollutant basis. Table 3-3 summarizes the emission factors utilized for estimation of potential emissions from the four CCCT units.

Table 3-3. Criteria Pollutant Potential Emission Factors for CCCT Units

Pollutant	Turbine System	
	Emission Factor	Unit
NO_X[1]	3	ppmv at 15% O_2
CO[2]	12	ppmv at 15% O_2
VOC[3]	4.5	ppmv at 15% O_2
Total $PM/PM_{10}/PM_{2.5}$[4]	0.008	lb/MMBtu
SO_2[5]	0.0014	lb/MMBtu
H_2SO_4[5]	0.0001	lb/MMBtu

[1] Current and proposed BACT limit for NO_X emissions from the CCCT units. Emission factor translates to 0.014 lb/MMBtu.

[2] Projects are not triggering PSD permitting for CO emissions. Potential emissions representations in this application are based on the current CO BACT limit of 12 ppm at 15% O_2. Emission factor translates to 0.0295 lb/MMBtu.

[3] Projects are not triggering PSD permitting for VOC emissions. Potential emissions representations in this application are based on the current VOC BACT limit of 4.5 ppm at 15% O_2. Emission factor translates to 0.0044 lb/MMBtu.

[4] Proposed BACT limit of 19.5 lb/hr for $PM/PM_{10}/PM_{2.5}$, which translates to 0.008 lb/MMBtu at 100% load. Value is representative of filterable only for PM, and filterable and condensable for $PM_{10}/PM_{2.5}$.

[5] Based on vendor data as provided by GE.

GHG emissions are calculated based on the defined CO_2 emission factor per 40 CFR 75 (Acid Rain Program) and the global warming potentials and emission factors per the GHG MRR promulgated per 40 CFR 98 Subparts A and C, respectively. Table 3-4 presents the derivation of GHG emissions for the CCCT units at OPC.

Table 3-4. GHG Emission Quantification

GHG	Emission Factor[1, 2] (lb/MMBtu)	Maximum Annual Operating Capacity[3] (Million MMBtu/yr)	Maximum Annual Emissions[4] (tpy)
CO_2	118.86	85.4	5,075,200
CH_4	2.20E-03	85.4	94.1
N_2O	2.20E-04	85.4	9.41
Total GHG emissions (CO_{2e})[5]			**5,080,359**
Each Unit (i.e., one gas turbine and one HRSG with duct burner)			**1,270,090**

1. CO_2 Emission factor derived per Appendix G to 40 CFR Part 75, Section 2.3. CO_2 (lb/MMBtu) = 1,040 scf/MMBtu * 44.0 lb/lb-mole / 385 scf CO_2/lb-mole
2. CH_4 and N_2O emissions factors per Part 98, Subpart C, Table C-2. kg/MMBtu factors converted to lb/MMBtu multiplying by 2.20462 lb/kg
3. Maximum Annual Operating Capacity anticipated for sustainable operation.
4. Emissions (tpy) = EF (lb/MMBtu) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton
5. Total GHG emissions in CO2e is the sum of the product of each GHG and its respective global warming potential (GWP) per 40 CFR Part 98 Subpart A, Table A-1, effective January 1, 2014.

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

3.8.2. Auxiliary Boilers

The facility auxiliary boilers criteria potential emissions are based on operation at 6,000 hours per year of operation per unit (per Permit Condition No. 3.3.15), and emission factors as shown in Table 3-5.[9]

[9] Permit No. 4911-213-0034-V-08-0

Table 3-5. Criteria Pollutant Potential Emission Factors for Auxiliary Boiler Units

Pollutant	Auxiliary Boilers	
	Emission Factor	Unit
NO_X[1]	30	ppmv at 3% O_2
CO[2]	0.037	lb/MMBtu
VOC[3]	0.0127	lb/MMBtu
Total $PM/PM_{10}/PM_{2.5}$[4]	0.010	lb/MMBtu
SO_2[5]	6.4 E-04	lb/MMBtu
H_2SO_4[5]	4.5 E-05	lb/MMBtu

[1] Current BACT limit for NO_X emissions from the Auxiliary Boiler units. Emission factor translates to approximately 0.036 lb/MMBtu

[2] Current BACT limit for CO emissions from the Auxiliary Boiler units.

[3] Current BACT limit for VOC emissions from the Auxiliary Boiler units.

[4] Current BACT limit for PM.

[5] Engineering Estimate.

3.8.3. Cooling Towers

Cooling tower emissions, as found in Appendix B, are calculated based on the estimated flow capacity of the cooling tower units, a vendor based drift rate, and facility recordkeeping documentation for the Total Dissolved Solids (TDS) concentration present in the waters processed at the cooling tower. This data is relied upon using emission estimation methods for cooling towers outlined in *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie, 2002, to estimate potential emissions from the facility cooling towers.

3.8.4. Emergency Generators and Fire Pump

Emissions from the fire pump engine (EU ID No. FP1) are calculated using factors from AP-42 Section 3.3, *Gasoline and Diesel Industrial Engines*, Tables 3.3-1 and 3.3-2 (October 1996). Emissions from the generator engines (EU ID No. GEN1 and GEN2) are calculated using factors from AP-42 Section 3.4, *Large Stationary Diesel And All Stationary Dual-fuel Engines*, Tables 3.4-1, 3.4-3, and 3.4-4 (October 1996). Emissions from these engines are calculated assuming 500 hours per year of operation per unit, consistent with Condition 3.3.20 of the current permit.[10] See Appendix B for detailed calculations.

3.8.5. HAP/TAP Emissions

HAP and toxic air pollutant (TAP) emissions are evaluated from facility sources based on a variety of resources including AP-42 based emission factors and site specific emission factors derived based on gas quality analysis data. Details regarding the estimation of HAP/TAP emissions, can be found in Appendix B.

3.8.6. Insignificant Emissions Sources

The facility has other small insignificant sources of emissions (e.g. fugitive piping leaks, roads, etc.) at the facility which are not quantified within the potential to emit estimates within this application.

[10] Permit No. 4911-213-0034-V-08-0

These projects will be subject to certain federal and state air regulations. This section of the application summarizes the air permitting requirements and key air quality regulations that will potentially apply to OPC T.A. Smith as a result of these projects. Applicability to NSR, Title V, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), GRAQC, and other potentially applicable regulations to the proposed projects are addressed herein.

4.1. NEW SOURCE REVIEW APPLICABILITY

The NSR permitting program generally requires a source to obtain a permit and undertake other obligations prior to construction of any project at an industrial facility if the proposed project results in an emissions increase in excess of certain pollutant threshold levels. EPD administers its major NSR permitting program through GRAQC Rule 391-3-1-.02(7), *Prevention of Significant Deterioration of Air Quality*, which establishes preconstruction, construction and operation requirements for new and modified sources.

The NSR program is comprised of two elements: NNSR and PSD. The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area where the facility is located is classified as "nonattainment" for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as "attainment" or "unclassifiable." OPC T.A. Smith is located in Murray County, which has been designated by the U.S. EPA as "attainment" or "unclassifiable" for all criteria pollutants.[11] Therefore, the facility is not subject to NNSR permitting requirements. However, new construction or modifications that result in emissions increases are potentially subject to PSD permitting requirements.

The PSD program only regulates emissions from "major" stationary sources of regulated air pollutants. A stationary source is considered PSD major if potential emissions of any regulated pollutant exceed the major source thresholds. The PSD major source threshold for OPC T.A. Smith is 100 tpy for all regulated pollutants, except GHG.[12, 13] OPC T.A. Smith is classified as an existing PSD major source since potential emissions of at least one regulated pollutant exceeds 100 tpy. For sources which are PSD major for at least one regulated pollutant, the emissions increases for all regulated pollutants resulting from the proposed project must be compared against the PSD SER to determine if the project is subject to PSD review. For CO_2e, PSD permitting is only required if the emissions increase from the proposed project exceeds the SER for CO_2e and the project is already undergoing PSD permitting for at least one other PSD-regulated pollutant.

As a PSD major source, emission increases from the proposed projects at OPC T.A. Smith must be compared to the PSD SER to determine if PSD permitting is required. The emissions increases from the proposed projects for each PSD-regulated pollutant compared to the respective SERs are shown in Table 4-1.

[11] 40 CFR 81.311

[12] Fossil fuel-fired steam electric plants of more than 250 MMBtu/hr input are on the "List of 28" named source categories which are subject to a lower major source threshold for criteria pollutants of 100 tpy.

[13] 40 CFR 52.21(b)(49)(iii)

Table 4-1. Project Emission Increases Compared to PSD SERs

Pollutant	Project Emissions Increase (tpy)	NSR Major Modification Threshold (tpy)	NSR Permitting Required?
SO_2	14.52	40	No
NO_X	127.50	40	Yes
CO	47.49	100	No
PM	153.32	25	Yes
Total PM_{10}	153.32	15	Yes
Total $PM_{2.5}$	153.32	10	Yes
VOC	36.02	40	No
CO_2e	2,897,635	75,000	Yes
H_2SO_4	2.43	7	No

As illustrated in Table 4-1, the proposed projects emissions increases exceeds the SERs for NO_X, Filterable PM, Total PM_{10}, Total $PM_{2.5}$, and CO_2e. Accordingly, PSD review is required for these pollutants.

4.2. TITLE V OPERATING PERMITS

40 CFR 70 establishes the federal Title V operating permit program. Georgia has incorporated the provisions of this federal program in its state regulation, Rule 391-3-1-.03(10), *Title V Operating Permits.* This regulation requires that all new and existing Title V major sources of air emissions obtain federally-approved state-administered operating permits. A major source as defined under the Title V program is a facility that has the potential to emit either more than 100 tpy for any criteria pollutant, more than 10 tpy for any single HAP, or more than 25 tpy for combined HAP. Potential emissions from OPC T.A. Smith exceed the major source threshold for several pollutants. Therefore, OPC T.A. Smith is subject to the Title V program and currently operates under the State issued Part 70 Operating Permit No. 4911-213-0034-V-08-0 effective January 4, 2016, and subsequent amendment No. 4911-213-0034-V-08-1 effective March 28, 2017 and amendment No. 4911-213-0034-V-08-2 issued October 3, 2018.

The proposed projects represent a significant modification of the operating permit. As such, the required Title V modification application elements are included in the Georgia EPD Online System (GEOS) submittal with Application No. 343540.

4.3. NEW SOURCE PERFORMANCE STANDARDS

NSPS, located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the proposed projects. Rules that are specific to certain source categories unrelated to the proposed project are not discussed in this regulatory review.

4.3.1. 40 CFR 60 Subpart A – General Provisions

All affected sources subject to source-specific NSPS are subject to the general provisions of NSPS Subpart A unless specifically excluded by the source-specific NSPS. Subpart A requires initial notification, performance testing, recordkeeping and monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable.

4.3.2. 40 CFR 60 Subpart D – Fossil Fuel-Fired Steam Generators > 250 MMBtu/hr

NSPS Subpart D, *Standards of Performance for Fossil-Fuel-Fired Steam Generators*, applies to fossil fuel-fired steam generating units with heat input capacities greater than 250 MMBtu/hr that have been constructed or modified since August 17, 1971. The rule defines a fossil fuel-fired steam generating unit as:[14]

> *A furnace or boiler used in the process of burning fossil fuel for the purpose of producing steam by heat transfer.*

The combustion turbines and duct burners will not be subject to NSPS Subpart D, because:

- The turbines do not burn fossil fuel for the purpose of producing steam; and
- Units that are subject to NSPS Subpart KKKK are not subject to NSPS Subpart D. Following the proposed modifications, OPC T.A. Smith's combustion turbines and HRSG with duct burners will be NSPS Subpart KKKK affected facilities.[15]

4.3.3. 40 CFR 60 Subpart Da – Electric Utility Steam Generating Units

NSPS Subpart Da, *Standards of Performance for Electric Utility Steam Generating Units*, provides standards of performance for electric utility steam generating units with heat input capacities greater than 250 MMBtu/hr of fossil fuel (alone or in combination with any other fuel) for which construction, modification or reconstruction commenced after September 18, 1978.[16]

Presently, per 40 CFR 60.40Da(e)(2), NSPS Subpart Da applies only to the HRSGs' duct burners, while the combustion turbines are subject to NSPS Subpart GG. NSPS Subpart Da does not include an applicability exemption for duct burners that are part of combined cycle turbine systems subject to NSPS Subpart GG.

However, as discussed in Section 4.3.7, AGP Project III will result in a modification (as defined in NSPS Subpart A) of the CCCTs. As such, upon completion of the proposed modifications, each CCCT system (i.e., combustion turbines and HRSGs with duct burners) will become subject to requirements per NSPS Subpart KKKK. As a result, NSPS Subpart Da will no longer apply to the HRSGs with duct burners per exemptions specified in both NSPS Subpart Da [40 CFR 60.40Da(e)(1)] and NSPS Subpart KKKK [40 CFR 60.4305(b)]. Therefore, following the AGP Project III, no units at OPC T.A. Smith will be subject to NSPS Subpart Da.

4.3.4. 40 CFR 60 Subpart Db – Steam Generating Units > 100 MMBtu/hr

NSPS Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, provides standards of performance for steam generating units with capacities greater than 100 MMBtu/hr for

[14] 40 CFR 60.41

[15] 40 CFR 60.40(e)

[16] 40 CFR 60.40Da(a)

which construction, modification, or reconstruction commenced after June 19, 1984.[17] The term "steam generating unit" is defined under this regulation as:[18]

> *Steam generating unit means a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium. This term includes any municipal-type solid waste incinerator with a heat recovery steam generating unit or any steam generating unit that combusts fuel and is part of a cogeneration system or a combined cycle system. This term does not include process heaters as they are defined in this subpart.*

The combustion turbines each have a heat input capacity greater than 100 MMBtu/hr. However, as previously stated, the units are not steam generating units. Therefore, the combustion turbines are not subject to NSPS Subpart Db.

The HRSGs also each have a heat input capacity greater than 100 MMBtu/hr. The HRSGs are not currently subject to NSPS Subpart Db, as steam generating units meeting the applicability requirements under NSPS Subpart Da are exempt from Subpart Db.[19] Following the completion of the proposed AGP Project III, the duct burners will no longer be subject to NSPS Subpart Da, as discussed in the previous section. However, pursuant to 40 CFR 60.40b(i), HRSGs that are associated with stationary combustion turbines that meet the applicability requirements of NSPS Subpart KKKK are not subject to NSPS Subpart Db. Similarly, NSPS Subpart KKKK exempts any HRSGs and duct burners subject to NSPS Subpart KKKK from the requirements of NSPS Subparts Da, Db, and Dc.[20] As the combustion turbines will be subject to NSPS Subpart KKKK following the proposed modifications, NSPS Subpart Db will not apply to either the combustion turbines or the HRSGs at OPC T.A. Smith.

4.3.5. 40 CFR 60 Subpart Dc – Small Steam Generating Units

NSPS Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, provides standards of performance for each steam generating unit for which construction, modification, or reconstruction commenced after June 9, 1989.[21] This subpart applies to steam generating units having a maximum rated heat input capacity of less than or equal to 100 MMBtu/hr and greater than or equal to 10 MMBtu/hr. NSPS Subpart Dc does not apply for similar reasons as detailed for NSPS Subpart Db: combustion turbines are not steam generating units, HRSGs subject to NSPS Subpart KKKK are exempt from NSPS Subpart Dc, and the size of the units exceeds the Subpart Dc applicability threshold.[22] However, the facility's existing natural gas-fired auxiliary boilers (31.4 MMBtu/hr each) are both subject to NSPS Dc. Neither of the proposed projects constitute a modification of the auxiliary boilers, and there are no changes to their applicable requirements under this rule as a result of the proposed project.

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[17] 40 CFR 60.40b(a)

[18] 40 CFR 60.41b

[19] 40 CFR 60.40b(e)

[20] 40 CFR 60.4305(b)

[21] 40 CFR 60.40c(a)

[22] 40 CFR 60.40c(e), 40 CFR 60.4305(b)

4.3.6. 40 CFR 60 Subpart GG – Stationary Gas Turbines

NSPS Subpart GG, *Standards of Performance for Stationary Gas Turbines*, applies to all stationary gas turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the lower heating value of the fuel fired, that are constructed, modified, or reconstructed after October 3, 1977.[23]

Presently, the combustion turbines are subject to NSPS Subpart GG. However, upon completion of the proposed modifications, the combustion turbine systems will be subject to the more recently promulgated standards for Stationary Combustion Turbines under NSPS Subpart KKKK. Pursuant to 40 CFR 60.4305(b) (NSPS Subpart KKKK), stationary combustion turbines regulated under NSPS Subpart KKKK are exempt from the requirements of NSPS Subpart GG. Therefore NSPS Subpart GG will no longer apply to the OPC T.A. Smith combustion turbines following the proposed project.

4.3.7. 40 CFR 60 Subpart KKKK – Stationary Combustion Turbines

NSPS Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines*, applies to all stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the lower heating value of the fuel fired, and were constructed, reconstructed, or modified after February 18, 2005.[24] OPC T.A. Smith has four natural gas-fired turbines, each with a heat input capacity exceeding 10 MMBtu/hr. To determine if the turbines will be subject to NSPS Subpart KKKK following either of the proposed projects, it is necessary to ascertain if a "modification" per the NSPS has occurred. For purposes of NSPS, a modification is defined as:[25]

> *…any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.*

More specifically, for an existing electric utility steam generating unit:[26]

> *No physical change, or change in the method of operation, at an existing electric utility steam generating unit shall be treated as a modification…provided that such change does not increase the maximum hourly emissions of any pollutant regulated under this section above the maximum hourly emissions achievable at that unit during the 5 years prior to the change.*

As AGP Project III results in an increased capacity of the turbine and duct burner systems, OPC has presumed that an increase in the amount of an air pollutant regulated by NSPS Subpart KKKK could occur on a short-term basis, since the heat input capacity of the system at 100% load is increasing. Therefore, once the proposed modification is complete, the OPC T.A. Smith combustion turbines will be subject to NSPS Subpart KKKK. Pursuant to 40 CFR 60.4305(a), the associated HRSG and duct burners will be subject to NSPS Subpart KKKK.

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[23] 40 CFR 60.330(a), (b)

[24] 40 CFR 60.4305(a), (b)

[25] 40 CFR 60.2

[26] 40 CFR 60.14(h)

Per 40 CFR 60.4305(b), stationary combustion turbines regulated under NSPS Subpart KKKK are exempt from the requirements of NSPS Subpart GG. HRSGs and duct burners regulated under NSPS Subpart KKKK are also exempt from the requirements of NSPS Subparts Da, Db, and Dc.

The following sections detail the applicable requirements as a result of NSPS Subpart KKKK applicability.

4.3.7.1. Emission Limits

Per Table 1 to Subpart KKKK, a modified combustion turbine is limited to NO_X emission limits depending on the type of fuel combusted and the heat input at peak load. For modified combustion turbines firing natural gas with a rating greater than 850 MMBtu/hr, the NO_X emission standard is 15 ppm at 15% O_2 or 0.43 lb/MWh useful output. Subpart KKKK also includes, for units greater than 30 MW output, a NO_X limit of 96 ppm at 15% O_2 or 4.7 lb/MWh useful output for turbine operation at ambient temperatures less than 0°F and turbine operation at loads less than 75% of peak load.[27] Compliance with the NO_X emission limit is determined on a 30 unit operating day rolling average basis.[28] As the combustion turbines and duct burners are presently subject to a NO_X limitation of 3 ppm at 15% O_2, 3-hour average per Condition 3.3.2 of the existing Title V operating permit, the new NSPS Subpart KKKK NO_X limitations will be subsumed by the facility's NO_X BACT limitation.

SO_2 emissions from combustion turbines located in the continental U.S. are limited to 0.9 lb/MWh gross output (or 110 ng/J), or the units must not burn any fuel with total potential sulfur emissions in excess of 0.060 lb SO_2/MMBtu heat input.[29]

4.3.7.2. Monitoring and Testing Requirements

Pursuant to 40 CFR 60.4333(a), the combustion turbines, air pollution control equipment, and monitoring equipment will be maintained in a manner that is consistent with good air pollution control practices for minimizing emissions. This requirement applies at all times including during startup, shutdown, and malfunction.

4.3.7.2.1 NO_X Compliance Demonstration Requirements

The combustion turbine systems presently employ a continuous emission monitoring system (CEMS) for NO_X per the requirements of the Acid Rain Program (ARP), promulgated in 40 CFR Part 75. Pursuant to 40 CFR 60.4340(b)(2)(iv), with state approval OPC T.A. Smith can rely on the methodologies per 40 CFR Part 75 Appendix E to demonstrate ongoing compliance with the NSPS Subpart KKKK NO_X emission limits. Sources demonstrating compliance with the NO_X emission limit via CEMS are not subject to the requirement to perform initial and annual NO_X stack tests.[30] Initial compliance with the NO_X emission limit will be demonstrated by comparing the arithmetic average of the NO_X emissions measurements taken during the initial relative accuracy test audit (RATA) required pursuant to 40 CFR 60.4405 to the NO_X emission limit under this subpart.[31]

4.3.7.2.2 SO_2 Compliance Demonstration Requirements

For compliance with the SO_2 emission limit, facilities are required to perform regular determinations of the total sulfur content of the combustion fuel and to conduct initial and annual compliance demonstrations. The total

[27] Table 1 to Subpart KKKK of Part 60

[28] 40 CFR 60.4350(h), 40 CFR 60.4380(b)(1)

[29] 40 CFR 60.4330(a)(1) or (a)(2), respectively

[30] 40 CFR 60.4340(b), 40 CFR 60.4405

[31] 40 CFR 60.4405(c)

sulfur content of gaseous fuel combusted in the combustion turbine must be determined and recorded once per operating day or using a custom schedule as approved by EPD;[32] however, OPC elects to opt out of this provision of the rule by using a fuel that is demonstrated not to exceed potential sulfur emissions of 0.060 lb/MMBtu SO_2.[33] This demonstration can be made using one of the following methods:

1. By using a purchase contract specifying that the fuel sulfur content for the natural gas is less than or equal to 20 grains of sulfur per 100 standard cubic feet and results in potential emissions not exceeding 0.060 lb/MMBtu.
2. By using representative fuel sampling data meeting the requirements of 40 CFR 75, Appendix D, Sections 2.3.1.4 or 2.3.2.4 which show that the sulfur content of the fuel does not exceed 0.060 lb SO_2/MMBtu heat input.

OPC is currently required to monitor the sulfur content of the natural gas burned in the combustion turbines and duct burners through submittal of a semiannual analysis of the gas by the supplier or the facility to demonstrate that the sulfur content does not exceed its excursion threshold of 0.2 grains per 100 standard cubic feet.[34] This sulfur content analysis by the supplier or OPC satisfies the sulfur content demonstration methodologies in 40 CFR 60.4365(a) and (b), respectively. Therefore, continued compliance with these existing permit conditions will guarantee compliance with these NSPS KKKK requirements.

4.3.7.3. Initial Notification

Per 40 CFR 60.7(a)(4), this permit application serves as the required notification for any physical or operational change to an existing facility which qualifies as an NSPS modification.

4.3.8. 40 CFR 60 Subpart TTTT – Greenhouse Gas Emissions for Electric Generating Units

NSPS Subpart TTTT, *Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units* applies to any fossil fuel fired steam generating unit, Integrated Gasification Combined Cycle (IGCC) unit, or stationary combustion turbine constructed after January 8, 2014 or reconstructed after June 8, 2014 and to any steam generating unit or IGCC modified after June 8, 2014, provided that unit has a base load rating greater than 250 MMBtu/hr and serves a generator capable of selling greater than 25 MW of electricity to the grid.[35] The existing CCCT generating units for OPC T.A. Smith each have peak heat inputs greater than 250 MMBtu/hr and serve a generator greater than 25 MW. Therefore, the CCCT generating units (including the duct burners) could potentially be subject to the provisions of NSPS TTTT.

With respect to stationary combustion turbines, NSPS Subpart TTTT applies only to units that commenced construction or reconstruction after June 18, 2014, not modification. "Reconstruction" is defined as the replacement of components of an existing affected facility such that the fixed capital cost of the new components exceeds 50% of the fixed capital cost that would be required to construct a comparable, entirely new affected facility that is technologically and economically capable of complying with the applicable standards. The total cost of the AGP Projects is $20.5 million for all four combustion turbines, and the cost of the Minimum Load Project is $20 million or less for all four turbines. In comparison, the cost of a comparable, entirely new "stationary combustion turbine" under NSPS Subpart KKKK is approximately $390 million. Thus, the costs of these projects are far less than 50% of four comparable, entirely new "stationary combustion turbines" under

[32] 40 CFR 60.4370(b) and (c)

[33] 40 CFR 60.4365

[34] Permit No. 4911-213-0034-V-08-0, Conditions 6.2.1, 6.2.2, and 6.1.7.c.i

[35] 40 CFR 60.5509(a)

Subpart KKKK. As the combustion turbines at OPC T.A. Smith are existing units and the proposed projects do not meet the reconstruction definition, the modifications to the turbine systems will not trigger applicability of NSPS Subpart TTTT requirements.[36]

4.3.9. Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. The applicability of a particular NSPS to the proposed project can be readily ascertained based on the industrial source category covered. All other NSPS, besides Subpart A, are categorically not applicable to the proposed project.

4.4. NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

NESHAP, located in 40 CFR 61 and 40 CFR 63, have been promulgated for source categories that emit HAP to the atmosphere. A facility that is a major source of HAP is defined as having potential emissions of greater than 25 tpy of total HAP and/or 10 tpy of individual HAP. Facilities with a potential to emit HAP at an amount less than that which is defined as a major source are otherwise considered an area source. The NESHAP allowable emissions limits are most often established on the basis of a maximum achievable control technology (MACT) determination for the particular major source. The NESHAP apply to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

OPC T.A. Smith is presently classified as an area source of HAP emissions and will remain so following the proposed projects. The determination of applicability to NESHAP requirements for the proposed projects is detailed in the following sections. Rules that are specific to certain source categories unrelated to the proposed projects are not discussed in this regulatory review.

4.4.1. 40 CFR 63 Subpart A – General Provisions

NESHAP Subpart A, *General Provisions*, contains national emission standards for HAP defined in Section 112(b) of the Clean Air Act. All affected sources, which are subject to another NESHAP in 40 CFR 63, are subject to the general provisions of NESHAP Subpart A, unless specifically excluded by the source-specific NESHAP.

4.4.2. 40 CFR 63 Subpart YYYY – Combustion Turbines

NESHAP Subpart YYYY, *NESHAP for Stationary Combustion Turbines*, establishes emission and operating limits for stationary combustion turbines located at major sources of HAP.[37] Natural gas turbines at major sources are presently only subject to initial notifications requirements.[38] As an area source of HAP, NESHAP Subpart YYYY does not apply to operations at OPC T.A. Smith.

[36] 40 CFR 60.5509(a)

[37] 40 CFR 63.6080

[38] 40 CFR 63.6095(d)

4.4.3. 40 CFR 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters

NESHAP Subpart DDDDD, *NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* (Major Source Boiler MACT) regulates boilers and process heaters at major sources of HAP.[39] As an area source of HAP, OPC T.A. Smith is not subject to the Major Source Boiler MACT. Furthermore, pursuant to 40 CFR 63.7575:

> *Boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering thermal energy in the form of steam or hot water. Controlled flame combustion refers to a steady-state, or near steady-state, process wherein fuel and/or oxidizer feed rates are controlled. A device combusting solid waste, as defined in §241.3 of this chapter, is not a boiler unless the device is exempt from the definition of a solid waste incineration unit as provided in section 129(g)(1) of the Clean Air Act. Waste heat boilers are excluded from this definition.*
>
> *Waste heat boiler means a device that recovers normally unused energy (i.e., hot exhaust gas) and converts it to usable heat. Waste heat boilers are also referred to as heat recovery steam generators. Waste heat boilers are heat exchangers generating steam from incoming hot exhaust gas from an industrial (e.g., thermal oxidizer, kiln, furnace) or power (e.g., combustion turbine, engine) equipment. Duct burners are sometimes used to increase the temperature of the incoming hot exhaust gas.*

The rule defines a "boiler" as an enclosed device using controlled combustion to recover thermal energy in the form of steam and/or hot water. The combustion turbines use the thermal energy of natural gas directly through combustion, without use of a steam or hot water cycle; they would not fall within the definition of a "boiler".

As the definition of "boiler" also specifically excludes "waste heat boilers," the modified duct burners and HRSGs at OPC T.A. Smith also would not be subject to NESHAP Subpart DDDDD even if the site were to become a major source in the future.

4.4.4. 40 CFR 63 Subpart UUUUU – Electric Utility Steam Generating Units

NESHAP Subpart UUUUU, *NESHAP for Electric Utility Steam Generating Units*, applies to electric utility steam generating units (EGUs) that combust coal or oil.[40] Furthermore, pursuant to 40 CFR 63.9983(a), area source stationary combustion turbines, other than IGCC units, are not subject to Subpart UUUUU. As the OPC T.A. Smith combustion turbines and duct burners combust natural gas only, and will continue to combust natural gas only, and are located at an area source, NESHAP Subpart UUUUU will not apply.

4.4.5. 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers at Area Sources

NESHAP Subpart JJJJJJ, *NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources* (Area Source Boiler MACT) regulates boilers at area sources of HAP.[41] Similar to the discussion in 4.4.3, the proposed turbines do not meet the boiler definition pursuant to 40 CFR 63.11237, which also excludes waste heat boilers:

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[39] 40 CFR 63.7480

[40] 40 CFR 63.9980

[41] 40 CFR 63.11193

Boiler means an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam and/or hot water. Controlled flame combustion refers to a steady-state, or near steady-state, process wherein fuel and/or oxidizer feed rates are controlled. A device combusting solid waste, as defined in § 241.3 of this chapter, is not a boiler unless the device is exempt from the definition of a solid waste incineration unit as provided in section 129(g)(1) of the Clean Air Act. Waste heat boilers, process heaters, and autoclaves are excluded from the definition of Boiler.

Furthermore, even if the turbines or duct burners did meet this definition, gas-fired boilers are exempt from NESHAP Subpart JJJJJJ.[42] Therefore, the requirements of NESHAP Subpart JJJJJJ do not apply to any equipment being modified as part of the proposed projects. Also, the facility auxiliary boilers only combust natural gas, rendering them exempt from NESHAP Subpart JJJJJJ.

4.4.6. Non-Applicability of All Other NESHAP

NESHAP are developed for particular industrial source categories. The applicability of a particular NESHAP to the proposed project can be readily ascertained based on the industrial source category covered. All other NESHAP are categorically not applicable to the proposed projects.

4.5. COMPLIANCE ASSURANCE MONITORING

Under 40 CFR 64, Compliance Assurance Monitoring (CAM) facilities are required to prepare and submit monitoring plans for certain emissions units with Title V operating permit applications. The CAM plans are intended to provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission units that use a control device to achieve compliance with an emission limit and whose pre-control emissions exceed the major source thresholds under the Title V operating program. For a subject unit whose post-control emissions also exceed the major source threshold, a CAM plan is required to be submitted with the initial or modification Title V operating permit application. For a subject unit whose post-control emissions are less than the major source threshold, a CAM plan does not have to be submitted until the next Title V renewal application.

Each combustion turbine/duct burner stack is equipped with an SCR to reduce NO_X emissions. In addition, these units have NO_X CEMS to verify proper operation. The combustion turbines are currently complying with the CAM plan included in Conditions 5.2.7 through 5.2.8 of Permit No. 4911-213-0034-V-08-0, which was derived through previously submitted CAM plans as part of prior historic permitting actions. At this time, no changes to the existing CAM requirements are requested. Therefore, no CAM documentation has been included within this permit application.

4.6. RISK MANAGEMENT PLAN

Subpart B of 40 CFR 68 outlines requirements for risk management prevention plans pursuant to Section 112(r) of the Clean Air Act. Applicability of the subpart is determined based on the type and quantity of chemicals stored at a facility. OPC T.A. Smith does not exceed the threshold quantity for any of the chemicals and is, therefore, not subject to 40 CFR 68 Subpart B. The proposed projects will not include changes to the facility's ammonia storage tanks or the concentration of ammonia stored and, therefore, will not impact the facility's requirements under 40 CFR 68. OPC T.A. Smith is and will continue to be subject to the General Duty Clause under the Clean Air Act Section 112(r)(1), which states:

[42] 40 CFR 63.11195(e)

The owners and operators of stationary sources producing, processing, handling or storing such substances [i.e., a chemical in 40 CFR part 68 or any other extremely hazardous substance] have a general duty [in the same manner and to the same extent as the general duty clause in the Occupational Safety and Health Act (OSHA)] to identify hazards which may result from (such) releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur.

4.7. STRATOSPHERIC OZONE PROTECTION REGULATIONS

The requirements originating from Title VI of the Clean Air Act, entitled *Protection of Stratospheric Ozone*, are contained in 40 CFR 82. Subparts A through E and Subparts G and H of 40 CFR 82 are not applicable to OPC T.A. Smith. 40 CFR 82 Subpart F, *Recycling and Emissions Reduction*, potentially applies if the facility operates, maintains, repairs, services, or disposes of appliances that utilize Class I, Class II, or non-exempt substitute refrigerants.[43] Subpart F generally requires persons completing the repairs, service, or disposal to be properly certified. It is expected that all repairs, service, and disposal of ozone depleting substances from such equipment (air conditioners, refrigerators, etc.) at the facility will be completed by a certified technician. OPC T.A. Smith will continue to comply with 40 CFR 82 Subpart F.

4.8. CLEAN AIR MARKETS REGULATIONS

Starting with the Acid Rain Program (ARP) mandated by the 1990 Clean Air Act Amendments, U.S. EPA has developed several market-based "cap and trade" regulatory programs. All market-based regulatory programs are overseen by U.S. EPA's Clean Air Markets Divisions (CAMD) and are referred to as CAMD regulations. The programs that are potentially applicable to OPC T.A. Smith are:

- Acid Rain Program (ARP) – 1990 - ongoing
- Clean Air Interstate Rule (CAIR) – 2009 - 2014
- Cross-State Air Pollution Rule (CSAPR) – 2015 (ongoing)

4.8.1. Acid Rain Program

In order to reduce acid rain in the United States and Canada, Title IV (40 CFR 72 *et seq.*) of the Clean Air Act Amendments of 1990 established the ARP to substantially reduce SO_2 and NO_X emissions from electric utility plants. Affected units are specifically listed in Tables 1 and 2 of 40 CFR 73.10 under Phase I and Phase II of the program. Upon Phase III implementation, the ARP in general applies to fossil fuel-fired combustion sources that drive generators for the purposes of generating electricity for sale. The turbines at OPC T.A. Smith are utility units subject to the ARP. The facility is subject to the requirements of 40 CFR 72 (permits), 40 CFR 73 (SO_2), and 40 CFR 75 (monitoring) but is not subject to the NO_X provisions (40 CFR 76) of the ARP regulations because the turbines do not have the capability to burn coal.

Under 40 CFR 75 of the ARP, OPC T.A. Smith is required to operate a NO_X CEMS for each unit to monitor the NO_X emission rate (lb/MMBtu) and to determine SO_2 and CO_2 mass emissions (tons) following the procedures in Appendices D and G, respectively. Further, the ARP requires the facility to possess SO_2 allowances for each ton of SO_2 emitted. The ARP also requires initial certification of the monitors within 90 days of commencement of commercial operation, quarterly reports, and an annual compliance certification. The ARP requirements are outlined in Section 7.9 and Attachment D of the Title V permit amendment No. 4911-213-0034-V-08-2. The

[43] 40 CFR 82.150

proposed projects will not alter any applicable requirements or compliance options of ARP to the OPC T.A. Smith operations. The facility will continue to maintain sufficient allowances under ARP for its operations.

4.8.2. Clean Air Interstate Rule / Cross-State Air Pollution Rule

The CAIR, 40 CFR 96, called for reductions in SO_2 and NO_X by utilizing an emissions trading program. More broadly, 40 CFR 96 also includes a forerunner to CAIR, the NO_X SIP Call / NO_X Budget program, and the name of 40 CFR 96 (NO_X Budget Trading Program for State Implementation Plans) still reflects the origins in regulating only NO_X.

The CSAPR was developed to require affected states to reduce emissions from power plants that contribute to ozone and/or particulate matter emissions.[44] Initially finalized on July 6, 2011, the CSAPR was scheduled to replace the CAIR on January 1, 2012. However, on December 30, 2011, the U.S. Court of Appeals for the District of Columbia Circuit (the "D.C. Circuit") stayed CSAPR, pending a subsequent decision. On August 21, 2012, the D.C. Circuit then vacated CSAPR, remanding it back to EPA for further rulemaking, leaving CAIR in effect until a replacement rule was promulgated.[45] Upon appeal, the U.S. Supreme Court – on April 29, 2014 – upheld the CSAPR, reversing the D.C. Circuit's decision and remanding the case back to that Court for further proceedings consistent with its April 2014 decision. Upon remand, the U.S. government filed a motion with the D.C. Circuit for a lift of the stay of CSAPR on June 26, 2014, and this motion was granted on October 23, 2014. Therefore, the CSAPR has replaced the CAIR. CSAPR Phase 1 implementation began January 1, 2015 for annual programs and May 1, 2015 for the ozone season program. Phase 2 implementation began on January 1, 2017 for annual programs and May 1, 2017 for ozone season programs.

Therefore, since CSAPR is currently effective, potential applicability is evaluated against the CSAPR Program and not CAIR. CSAPR applicability is found in 40 CFR 97.404 and definitions in 40 CFR 97.402 and implemented via Georgia EPD through GRAQC 391-3-1-.02(12) – (13). The CSAPR rule aims to improve air quality by reducing emissions from power plants that contribute to ozone and/or fine particulate pollution in other states. Georgia is subject to CSAPR programs for both fine particles (SO_2 and annual NO_X) and ozone (ozone season NO_X).[46]

CSAPR applicability is similar but distinct from ARP, with applicability criteria and definitions per 40 CFR 97.402.[47] In general, CSAPR regulates fossil-fuel-fired boilers and combustion turbines serving, on any day starting November 15, 1990 or later, an electrical generator with a nameplate capacity exceeding 25 MWe and producing power for sale. OPC T.A. Smith's CCCTs are affected sources under this regulation, and the proposed projects will not alter any applicable requirements or compliance options of CSAPR to the facility's operations. OPC T.A. Smith will continue to maintain sufficient allowances under CSAPR for its operations.

[44] http://www.epa.gov/airtransport/

[45] EME Homer City Generation, L.P. v. U.S. EPA. U.S. Court of Appeals for the District of Columbia Circuit, No. 11-1302, decided August 21, 2012.

[46] https://www.epa.gov/airmarkets/map-states-covered-csapr

[47] CSAPR applicability and definitions are repeated in four separate subparts of 40 CFR 97, but each has identical definitions and applicability requirements. Subpart AAAAA (5A), which is for the NO_X Annual program, is used in this discussion.

4.9. STATE REGULATORY REQUIREMENTS

In addition to federal air regulations, GRAQC Chapter 393-3-1 establishes regulations applicable at the emission unit level (source specific) and at the facility level.[48] This section reviews the source specific requirements for the proposed projects and does not detail generally applicable requirements such as payment of permit fees.

4.9.1. GRAQC 391-3-1-.02(2)(b) – Visible Emissions

Rule (b) limits the visible emissions from any emissions source not subject to some other visible emissions limitation under GRAQC 391-3-1-.02 to 40% opacity. Visible emissions testing may be required at the discretion of the Director. The combustion turbines at OPC T.A. Smith are subject to this regulation. The duct burners are subject to more stringent visible emissions standards through Rule 391-3-1-.02(2)(d) and are, therefore, not subject to Rule (b).

The turbines fire pipeline-quality natural gas with emissions exhibiting minimal opacity; the firing of clean fuels in conjunction with proper operation ensures compliance with this rule. No applicable requirements per Rule (b) will be altered as a result of the proposed projects.

4.9.2. GRAQC 391-3-1-.02(2)(d) – Fuel-Burning Equipment

Rule (d) limits the PM emissions, visible emissions, and NO_X emissions from fuel-burning equipment. The standards are applied based on installation date, the heat input capacity of the unit, and the fuel(s) combusted. The GRAQC define "fuel-burning equipment" as follows:[49]

> *"Fuel-burning equipment" means equipment the primary purpose of which is the production of thermal energy from the combustion of any fuel. Such equipment is generally that used for, but not limited to, heating water, generating or super heating steam, heating air as in warm air furnaces, furnishing process heat indirectly, through transfer by fluids or transmissions through process vessel walls.*

The combustion turbines are used for the generation of electric power, not the production of thermal energy. Therefore, they do not meet the definition of fuel burning equipment. The duct burners do, however, meet this definition and are therefore subject to this rule.

The duct burners were installed or modified after January 1, 1972, making them subject to the PM standards for new units under 391-3-1-.02(2)(d)2. Since each duct burner has a heat input capacity exceeding 250 MMBtu/hr, each duct burner has a PM emission limit of 0.10 lb/MMBtu.[50] This limit will not change once the propose modification is complete. The PM emission limits for the duct burners are subsumed by the more stringent PM emission limit found in Condition 3.3.2.c of the current operating permit and will be subsumed by the proposed BACT limit.

All fuel-burning equipment constructed after January 1, 1972 is subject to a visible emissions limit of 20% except for one six minute period per hour of not more than 27% opacity. This limit applies to the duct burners.[51] The opacity limit will not change once the propose modification is complete. The opacity limitation for the duct

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[48] Current through rules and regulations filed through January 25, 2019. http://rules.sos.ga.gov/gac/391-3-1

[49] GRAQC 391-3-1-.01(cc)

[50] GRAQC 391-3-1-.02(2)(d)2(iii)

[51] GRAQC 391-3-1-.02(2)(d)3

burners is subsumed by the more stringent opacity limitation given in Condition 3.3.2.e of the current operating permit.

Lastly, fuel-burning equipment that has a heat input capacity greater than 250 MMBtu/hr; that was constructed after January 1, 1972; and that combusts coal, oil, or gas is subject to a NO_X emission limit. Since the duct burners are gas-fired units, they are subject to a NO_X emission limitation of 0.2 lb/MMBtu.[52] The NO_X emission limit will not change once the propose modification is complete. This limit is subsumed by the more stringent NO_X BACT limitation for the combustion turbines/duct burners.

4.9.3. GRAQC 391-3-1-.02(2)(e) – Particulate Emissions from Manufacturing Processes

Rule (e), commonly known as the process weight rule, establishes PM limits where not elsewhere specified. As the duct burners are fuel-burning equipment, they are subject to a separate particulate limit per Rule (d). Combustion turbines are not technically subject to Rule (d) and historically have not been regulated by Rule (e). Therefore, the combustion turbines and duct burners at OPC T.A. Smith are not subject to this regulation.

4.9.4. GRAQC 391-3-1-.02(2)(g) – Sulfur Dioxide

Rule (g) limits the maximum sulfur content of any fuel combusted in a fuel-burning source, based on the heat input capacity. As this rule applies to fuel-burning sources, not "fuel-burning equipment," this regulation presently applies to the combustion turbines and duct burners. For the duct burners and turbines, which have heat input capacities greater than 100 MMBtu/hr, the fuel sulfur content is limited to not more than 3% by weight.[53] The proposed projects do not alter the applicable requirements of Rule (g), and OPC T.A. Smith will continue to comply with Rule (g). This limit is subsumed by the more stringent fuel sulfur limit under NSPS Subpart KKKK.

4.9.5. GRAQC 391-3-1-.02(2)(n) – Fugitive Dust

Rule (n) requires facilities to take reasonable precautions to prevent fugitive dust from becoming airborne. OPC will continue to take the appropriate precautions to prevent fugitive dust from becoming airborne for any applicable equipment.

4.9.6. GRAQC 391-3-1-.02(2)(tt) – VOC Emissions from Major Sources

Rule (tt) limits VOC emissions from facilities that are located in or near the original Atlanta 1-hour ozone nonattainment area. OPC T.A. Smith is not located within the geographic area covered by this rule and is, therefore, not subject to this regulation.[54]

4.9.7. GRAQC 391-3-1-.02(2)(uu) – Visibility Protection

Rule (uu) requires EPD to provide an analysis of a proposed major source or a major modification to an existing source's anticipated impact on visibility in any federal Class I area to the appropriate Federal Land Manager (FLM). The visibility-impacting pollutants include NO_X, PM_{10}, SO_2, and H_2SO_4. A screening analysis of federal Class I areas resulted in a Q/d value less than 10. Although one of the federal Class I areas (Cohutta) is within 50 km, special stipulation by the FLM indicated that since Q/D was less than 10 for Cohutta, no detailed Air

[52] GRAQC 391-3-1-.02(2)(d)4(iii)

[53] GRAQC 391-3-1-.02(2)(g)2

[54] GRAQC 391-3-1-.02(2)(tt)3

Quality Related Values (AQRV) analysis (e.g., visibility) would be required. Therefore, a full review of the anticipated impact on visibility was not performed. Further documentation regarding an evaluation of impacts related to these projects on Class I areas, and further documentation referenced such as correspondence with the appropriate FLM, is provided in Volume II of this application.

4.9.8. GRAQC 391-3-1-.02(2)(jjj) – NO_X from Electric Utility Steam Generating Units

Rule (jjj) limits NO_X emissions from electric utility steam generating units located in or near the original Atlanta 1-hour ozone nonattainment area. OPC T.A. Smith is not located within the geographic area covered by this rule.[55] Therefore, Rule (jjj) is not applicable.

4.9.9. GRAQC 391-3-1-.02(2)(lll) – NO_X from Fuel-Burning Equipment

Rule (lll) limits NO_X emissions from fuel-burning equipment with capacities between 10 and 250 MMBtu/hr that are located in or near the original Atlanta 1-hour ozone nonattainment area. OPC T.A. Smith is not located within the geographic area covered by this rule and is, therefore, not subject to this regulation.[56]

4.9.10. GRAQC 391-3-1-.02(2)(mmm) – NO_X Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity

Rule (mmm) restricts NO_X emissions from small combustion turbines located in or near the Atlanta nonattainment area that are used to generate electricity. OPC T.A. Smith is located in Murray County, which is not one of the listed counties regulated under this rule.[57] Therefore, Rule (mmm) does not apply.

4.9.11. GRAQC 391-3-1-.02(2)(nnn) – NO_X Emissions from Large Stationary Gas Turbines

Additional restrictions apply to NO_X emissions from sources located in or near the original Atlanta 1-hour ozone nonattainment area. Specifically, these regulations limit NO_X emissions from stationary gas turbines used to generate electricity. OPC T.A. Smith is located in Murray County, which is not one of the listed counties regulated under this rule.[58] Therefore, Rule (nnn) does not apply.

4.9.12. GRAQC 391-3-1-.02(2)(rrr) – NO_X from Small Fuel-Burning Equipment

Rule (rrr) specifies requirements for fuel-burning equipment with capacities of less than 10 MMBtu/hr located in or near the original Atlanta 1-hour ozone nonattainment area. OPC T.A. Smith is not located within the geographic area covered by this rule, and is, therefore, not subject to this regulation.[59]

4.9.13. GRAQC 391-3-1-.02(2)(sss) – Multipollutant Control for Electric Utility Steam Generating Units

Rule (sss) applies to certain large electric utility steam generating units listed within the rule. OPC T.A. Smith is not subject to this regulation, because none of its units are listed in the regulation.

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[55] GRAQC 391-3-1-.02(2)(jjj)8

[56] GRAQC 391-3-1-.02(2)(lll)4

[57] GRAQC 391-3-1-.02(2)(mmm)6

[58] GRAQC 391-3-1-.02(2)(nnn)6

[59] GRAQC 391-3-1-.02(2)(rrr)2

4.9.14. GRAQC 391-3-1-.02(2)(uuu) – SO_2 Emissions from Electric Utility Steam Generating Units

Rule (uuu) applies to certain large electric utility steam generating units listed within the rule. OPC T.A. Smith is not subject to this regulation, because none of its units are listed in the regulation.

4.9.15. GRAQC 391-3-1-.02(12), (13), and (14) – Cross State Air Pollution Rules (Annual NO_X, Annual SO_2, and Ozone Season NO_X)

These regulations incorporate the Cross State Air Pollution Rule (CSAPR) requirements into the Georgia Rules for Air Quality Control. The regulations provide allocations for Georgia for 2017 and thereafter.

4.9.16. GRAQC 391-3-1-.03(1) – Construction (SIP) Permitting

The proposed projects will require physical construction activities to complete the proposed modifications. Potential emissions associated with the proposed projects are above the *de minimis* construction permitting thresholds specified in GRAQC 391-3-1-.03(6)(i).[60] Further, as discussed in Section 4.1, PSD permitting is required for NO_X, filterable PM, total PM_{10}, total $PM_{2.5}$, and CO_2e. Therefore, a construction permit application is necessary and the appropriate forms are included in Appendix D.

4.9.17. GRAQC 391-3-1-.03(10) – Title V Operating Permits

The potential emissions of certain pollutants exceed the major source thresholds established by Georgia's Title V operating permit program. Therefore, OPC T.A. Smith is a Title V major source. The facility currently operates under Permit No. 4911-213-0034-V-08-0 and associated amendments. This application represents a significant modification to the existing Title V operating permit; accordingly a GEOS application has been submitted to address Title V related permitting requirements.

4.9.18. Incorporation of Federal Regulations by Reference

The following federal regulations are incorporated in the GRAQC by reference and were addressed previously in the application:

- GRAQC 391-3-1-.02(7) – PSD
- GRAQC 391-3-1-.02(8) – NSPS
- GRAQC 391-3-1-.02(9) – NESHAP
- GRAQC 391-3-1-.02(10) – Chemical Accident Prevention
- GRAQC 391-3-1-.02(11) – CAM
- GRAQC 391-3-1-.02(12) – CSAPR for Annual NO_X
- GRAQC 391-3-1-.02(13) – CSAPR for Annual SO_2
- GRAQC 391-3-1-.02(14) – CSAPR for Ozone Season NO_X
- GRAQC 391-3-1-.13 – ARP

4.9.19. Non-Applicability of Other GRAQC

A thorough examination of the GRAQC applicability to the proposed projects reveals many GRAQC that do not currently apply, will not apply once the proposed modifications are complete, and do not impose additional

[60] Based on Georgia EPD guidance, usage of the *de minimis* permitting exemption thresholds must consider actual-to-potential emissions increases, not actual-to-projected actual emissions increases.

requirements on operations. Such GRAQC rules include those specific to a particular type of industrial operation which is not and will not be performed at OPC T.A. Smith or is not impacted by the proposed projects.

This section discusses the regulatory basis for BACT, the approach used in completing the BACT analyses, and the BACT analyses for the modified turbine systems. Based on the BACT review, OPC proposes the technology and limits presented in Table 5-1 as BACT for the modified units.

Table 5-1. Summary of Proposed BACT Limits

Unit	Pollutant	Selected BACT	Emission / Operating Limit	Compliance Method
Combustion Turbine and HRSG Duct Burner System	Filterable PM/Total PM_{10}/Total $PM_{2.5}$	Good Combustion and Operating Practices and Low Sulfur Fuels	19.5 lb/hr	Performance Test
	NO_X	SCR, DLN Combustors, and Good Combustion Practices	3.0 ppmvd at 15% O_2 on a 3-hour rolling average basis 279 tpy per rolling 12-months (each Block containing 2 CCCTs) 1,153 lb/day (each CCCT)	CEMS
	GHGs	Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices	1,270,090 tpy CO_2e per rolling 12-months (each CCCT)	Records of Fuel Usage

5.1. BACT REQUIREMENT

The BACT requirement applies to each new or modified emission unit from which there is an emissions increase of pollutants subject to PSD review. OPC has determined that the proposed projects are subject to PSD permitting for filterable PM, total PM_{10}, total $PM_{2.5}$, NO_X, and GHGs, and thus, is subject to BACT for these pollutants. A BACT review is required for each physically modified emission unit. Accordingly, a BACT analysis and detailed discussion of each pollutant subject to PSD permitting is assessed herein for the combustion turbine systems, including the combustion turbine and HRSG with duct burner. No other units are being physically modified or constructed as part of the proposed projects.

5.2. BACT DEFINITION

The requirement to conduct a BACT analysis is set forth in the PSD regulations [40 CFR 52.21(j)(3)]:

> *(j) Control Technology Review.*
>
> *(3) A major modification shall apply best available control technology for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emissions unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit.*

BACT is defined in the PSD regulations [40 CFR 52.21(b)(12)] as:

> *… an **emissions limitation** (including a visible emission standard) based on the maximum degree of reduction for **each pollutant** subject to regulation under Act which would be emitted from any proposed major stationary source or major modification which the Administrator, 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 which would **exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61.***
> [primary BACT definition]
>
> *If the Administrator 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 achievable 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 which achieve equivalent results.*
> [allowance for secondary BACT standard under certain conditions]

The primary BACT definition can be best understood by breaking it apart into its separate components.

5.2.1. Emission Limitation

…an emissions limitation…

First and foremost, BACT is an emission limit. While BACT is predicated upon the application of technologies to achieve that limit, the final result of BACT is a limit. In general, when quantifiable and measurable, this limit would be expressed as an emission rate limit of a pollutant (e.g., lb/ton, ppm, lb/hr or lb/MMBtu).[61] Furthermore, U.S. EPA's guidance on GHG BACT has indicated that GHG BACT limitations should be averaged over long-term timeframes such as 30- or 365-day rolling averages.[62] It should be noted that the secondary BACT definition per 40 CFR 52.21(b)(12) identifies that in cases where the implementation of an emission limitation is deemed infeasible, a design, equipment, work practice, operational standard or combination of the same may be prescribed as a BACT standard.

5.2.2. Each Pollutant

…each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification…

[61] Emission limits can be broadly differentiated as "rate-based" or "mass-based." For a boiler, a rate-based limit would typically be in units of lb/MMBtu (mass emissions per heat input). In contrast, a typical mass-based limit would be in units of lb/hr (mass emissions per time).

[62] *PSD and Title V Permitting Guidance for Greenhouse Gases*. March 2011, page 46.

BACT is analyzed for each pollutant, not a combination of pollutants, even where the technology reduces emissions of more than one pollutant. This is particularly important in performing costs analyses.

While BACT emission limits for PM_{10} and $PM_{2.5}$ must include the condensable portion of particulate, most demonstrated control techniques are limited to those that reduce filterable particulate matter. As such, control techniques for filterable PM or PM_{10} also reduce filterable $PM_{2.5}$. The PM BACT analyses for filterable PM and filterable PM_{10} will also satisfy BACT for the filterable portion of $PM_{2.5}$. In the prepared BACT analyses, references to PM_{10} are also relevant for $PM_{2.5}$. A potential source of secondary particulate matter from the proposed projects is due to NO_X emissions from the turbines and duct burners. As OPC operates SCR control on each turbine system, secondary PM BACT is effectively addressed by controlling the direct emissions of NO_X. As such, secondary PM BACT is not required to be addressed separately.

For PSD applicability assessments involving GHGs, the regulated NSR pollutant subject to regulation under the Clean Air Act is the sum of **six** greenhouse gases and not a single pollutant.[63] Though the primary GHG emissions from natural gas combustion at the combustion turbine systems are of carbon dioxide (CO_2), GHG BACT is discussed separately for the following additional GHG components: methane (CH_4) and nitrous oxide (N_2O).

5.2.3. Case-by-Case Basis

…a case-by-case basis, taking into account energy, environmental and economic impacts and other costs…

Unlike many of the Clean Air Act programs, the PSD program's BACT evaluation is case-by-case. As noted by U.S. EPA,

> *The case-by-case analysis is far more complex than merely pointing to a lower emissions limit or higher control efficiency elsewhere in a permit or a permit application. The BACT determination must take into account all of the factors affecting the facility, such as the choice of [fuel]… The BACT analysis, therefore, involves judgment and balancing.* [64]

The case-by-case analysis has also been affirmed by the U.S. EPA Environmental Appeals Board in an order denying review of the PSD permit for the La Paloma Energy Center:[65]

> *As the Board explained in In re Northern Michigan University ("NMU"), the BACT definition requires permit issuers to "proceed[ ] on a case-by-case basis, taking a careful and detailed look, attentive to the technology or methods appropriate for the particular facility, [ ] to seek the result tailor-made for that facility and that pollutant. 14 E.A.D. 283, 291 (EAB 2009)*

To assist applicants and regulators with the case-by-case process, in 1987 U.S. EPA issued a memorandum that implemented certain program initiatives to improve the effectiveness of the PSD program within the confines of existing regulations and state implementation plans.[66] Among the initiatives was a "top-down" approach for determining BACT. In brief, the top-down process suggests that all available control technologies be ranked in

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[63] The six GHGs are: CO_2, N_2O, CH_4, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

[64] U.S. EPA Responses to Public Comments on the Proposed PSD Permit for the Desert Rock Energy Facility, July 31, 2008, pages 41-42.

[65] U.S. EPA Environmental Appeals Board decision, In re: La Paloma Energy Center L.L.C. PSD Appeal No. 13-10, decided March 14, 2014. Environmental Administrative Decisions, Volume 16, page 273.

[66] Memo dated December 1, 1987, from J. Craig Potter (EPA Headquarters) to EPA Regional Administrators, titled "Improving New Source Review Implementation."

descending order of control effectiveness. The most stringent or "top" control option is the default BACT emission limit unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option is not achievable in that case. Upon elimination of the most stringent control option based upon energy, environmental, and/or economic considerations, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

The five steps in a top-down BACT evaluation can be summarized as follows:

Step 1. Identify all possible control technologies;

Step 2. Eliminate technically infeasible options;

Step 3. Rank the technically feasible control technologies based upon emission reduction potential;

Step 4. Evaluate ranked controls based on energy, environmental, and/or economic considerations; and

Step 5. Select BACT.

Each of these steps is discussed in detail in Section 5.4. While the top-down BACT analysis is a procedural approach suggested by U.S. EPA policy, this approach is not specifically mandated as a statutory requirement of the BACT determination. As discussed in Section 5.2.1, the BACT determination is an emissions limitation and does not require the installation of any specific control device.

5.2.4. Achievable

…based on the maximum degree of reduction …[that Georgia EPD] *… determines is achievable … through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques…*

BACT is to be set at the lowest value that is achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life.

As discussed by the DC Circuit Court of Appeals,

> *In National Lime Ass'n v. EPA, 627 F.2d 416, 431 n.46 (D.C. Cir. 1980), we said that where a statute requires that a standard be "achievable," it must be achievable "under most adverse circumstances which can reasonably be expected to recur."*[67]

U.S. EPA has reached similar conclusions in prior determinations for PSD permits.

> *Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured 'emissions rates,' which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the 'emissions limitation' determined to be BACT and set forth in the permit, which the facility is required to continuously meet throughout the facility's life. Stated simply, if there is uncontrollable fluctuation or variability in the measured emission rate, then the lowest measured emission rate will necessarily be more stringent than the "emissions limitation" that is "achievable" for that pollution control method over the life of the facility. Accordingly, because the "emissions limitation" is applicable for the facility's life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the*

[67] As quoted in Sierra Club v. U.S. EPA (97-1686).

extent to which the available data demonstrate whether the emissions rate at issue has been achieved by other facilities over a long term.[68]

More recently, this issue was addressed for GHG BACT:[69]

Efficiency standards may vary on a case-by-case basis to account for site variability (e.g., altitude) and other factors that could impact process efficiency. In addition, any system will "age" over time and achievable efficiencies may deteriorate. Section 169 contains multiple statutory factors that must be evaluated in determining the "maximum degree of reduction" on which BACT is based. Efficiency improvements in combination with some other control option could be listed as the maximum control, in which case the standard process limits would likely incorporate the effects of the more efficient design and a separate "efficiency" standard would not be necessary. Page B.l6 of the 1990 Draft NSR Workshop Manual notes that "combinations of techniques should be considered to the extent they result in more effective means of achieving stringent emissions levels represented by the "top" alternative, particularly if the "top" alternative is eliminated.[70]

This stance continues to be affirmed by the U.S. EPA Environmental Appeals Board in an order denying review of the PSD permit for the La Paloma Energy Center:[71]

"…the Board has recognized that permitting authorities are not always required to impose the highest possible level of control efficiency, but may take case-specific circumstances into consideration in determining what level of control is achievable for a given source. See In re Russell City Energy Ctr., 15 E.A.D. 1, 58-61 (EAB 2010) (rejecting a "bright line" test of requiring the highest or average level of control that another source has achieved), petition denied sub nom. Chabot-Las Positas Cmty, Coll. Dist. V. EPA, 428 F. App'x 219 (9th Cir. 2012); In re Newmont Nev. Energy Inv., LLC, 12 E.A.D. 429, 441 (EAB 2005). ("We recently explained that '[t]he underlying principle of all of these cases is that PSD permit limits are not necessarily a direct translation of the lowest emissions rate that has been achieved by a particular technology at another facility, but that those limits must also reflect consideration of any practical difficulties associated with using the control technology." (citing In re Cardinal FG Co., 12 E.A.D. 153, 170 (EAB 2005)))

Thus, BACT must be set at the lowest feasible emission rate recognizing that the emission unit must be in compliance with that limit for the lifetime of the unit on a continuous basis. While viewing individual unit performance can be instructive in evaluating what BACT might be, any actual performance data must be viewed carefully, as rarely will the data be adequate to truly assess the performance that a unit will achieve during its entire operating life. While statistical variability of actual performance can be used to infer what is "achievable," such testing requires a detailed test plan akin to what teams in U.S. EPA use to develop MACT standards over a several year period, and is far beyond what is reasonable to expect of an individual source. In contrast to limited

[68] U.S. EPA Environmental Appeals Board decision, In re: Newmont Nevada Energy Investment L.L.C. PSD Appeal No. 05-04, decided December 21, 2005. Environmental Administrative Decisions, Volume 12, page 442.

[69] Clean Air Act Advisory Committee (CAAAC) Climate Change Workgroup, *Report of Issue Group 2: Technical Feasibility* https://www.epa.gov/caaac/climate-change-workgroup-reports-and-presentations

[70] https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf

[71] U.S. EPA Environmental Appeals Board decision, In re: La Paloma Energy Center L.L.C. PSD Appeal No. 13-10, decided March 14, 2014. Environmental Administrative Decisions, Volume 16, pages 280-281.

snapshots of actual performance data, emission limits from similar sources can reasonably be used to infer what is "achievable."[72]

To assist in meeting the BACT limit, the source must consider production processes or available methods, systems or techniques, as long as those considerations do not redefine the source (see Section 5.5).

5.2.5. Floor

Emissions [shall not] exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61.

The least stringent emission rate allowable for BACT is any applicable limit under either New Source Performance Standards (NSPS – Part 60) or National Emission Standards for Hazardous Air Pollutants (NESHAP – Parts 61 and 63).[73] State SIP limitations must also be considered when determining the floor. The modified combustion turbine systems are subject to NO_X and SO_2 emission limits under NSPS Subpart KKKK. The modified turbine systems are not subject to any NSPS or NESHAP standard for $PM/PM_{10}/PM_{2.5}$ or GHGs and thus there is no floor of allowable filterable PM or total $PM_{10}/PM_{2.5}$ or GHGs BACT limits.[74]

5.3. BACT ASSESSMENT METHODOLOGY

The primary document referenced for the traditional "top-down" BACT methodology is U.S. EPA's 1990 *NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting*.[75] U.S. EPA has issued the following guidance documents related to the completion of GHG BACT analyses, which also have relevance to other NSR pollutants. These documents were utilized as resources in completing the BACT evaluation for the proposed projects:

- *PSD and Title V Permitting Guidance For Greenhouse Gases*[76]
- *Air Permitting Streamlining Techniques and Approaches for Greenhouse Gases: A Report to the U.S. Environmental Protection Agency from the Clean Air Act Advisory Committee; Permits, New Source Reviews and Toxics Subcommittee GHG Permit Streamlining Workgroup; Final Report*[77]
- *2010 Group Reports from the Clean Air Act Advisory Committee, Climate Change Work Group*[78]

[72] Emission limits must be used with care in assessing what is "achievable." Limits established for facilities which were never built must be viewed with care, as they have never been demonstrated and that company never took a significant liability in having to meet that limit. Likewise, permitted units which have not yet commenced construction must also be viewed with special care for similar reasons.

[73] While not specified as the BACT floor, NESHAP under 40 CFR 63 sometimes regulate NSR pollutants as a surrogate for non-NSR pollutants.

[74] As discussed in Section 4.3.8, NSPS Subpart TTTT does not regulate modified combustion turbine systems.

[75] U.S. EPA, October 1990. https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf.

[76] U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, (Research Triangle Park, NC: March 2011). https://www.epa.gov/sites/production/files/2015-07/documents/ghgguid.pdf.

[77] U.S. EPA, September 2012. https://www.epa.gov/sites/production/files/2014-08/documents/ghg-permit-streamlining-final-report.pdf.

[78] https://www.epa.gov/caaac/climate-change-workgroup-reports-and-presentations.

5.4. BACT "TOP-DOWN" APPROACH

The following sections present the top-down BACT analysis for each pollutant for which these projects trigger PSD and is specific to each emission unit, unless otherwise specified. The five steps in such an evaluation can be summarized as follows:[79]

- **Step 1.** Identify all possible control technologies;
- **Step 2.** Eliminate technically infeasible control options;
- **Step 3.** Rank the technically feasible control technologies based upon emission reduction potential;
- **Step 4.** Evaluate ranked control technologies based on energy, environmental, and/or economic considerations; and
- **Step 5.** Select BACT.

This process is typically conducted on a unit-by-unit, pollutant-by-pollutant basis. While the top-down BACT analysis is a procedural approach suggested by U.S. EPA policy, this approach is not specifically mandated as a statutory requirement of the BACT determination. BACT for the proposed projects has been evaluated via this "top-down" approach.

5.4.1. Identification of Potential Control Technologies (Step 1)

Available control technologies with the practical potential for application to the emission unit are identified. The application of demonstrated control technologies in other similar source categories to the emission unit in question can also be considered. While identified technologies may be eliminated in subsequent steps in the analysis based on technical and economic infeasibility or environmental, energy, economic or other impacts, control technologies with potential application to the emission unit under review are identified in this step. Under Step 1 of a criteria pollutant BACT analysis, the following resources are typically consulted when identifying potential technologies:

1. U.S. EPA's RBLC database
2. Determinations of BACT by regulatory agencies for other similar sources or air permits and permit files from federal or state agencies
3. Engineering experience with similar control applications
4. Information provided by air pollution control equipment vendors with significant market share in the industry
5. Review of literature from industrial technical or trade organizations

Trinity Consultants reviewed recently issued air permits and permit files and performed searches of the RBLC database in October 2018 to identify the emission control technologies and emission levels that were determined by permitting authorities as BACT within the past ten years for emission sources comparable to the proposed project. For combustion turbines, the following categories were searched:[80]

- Permit Data between 10/25/2008 and 10/25/2018

[79] This five step process can be directly applied to GHGs without any significant modifications, per *PSD and Title V Permitting Guidance for Greenhouse Gases*.

[80] The proposed combustion turbine system modifications are for combined cycle combustion turbines with HRSGs with duct burners. RBLC searches were performed for simple cycle combustion turbines as well as combined cycle for completeness.

- Process Type: 15.110 Large Natural Gas Simple Cycle Combustion Turbines and 15.210 Large Natural Gas Combined Cycle Combustion Turbines[81]
- Process Pollutants: All[82]
- Results are for USA, Mexico, and Canada

Appendix C presents summary tables of relevant BACT determinations for the proposed emission units.

5.4.2. Elimination of Technically Infeasible Control Options (Step 2)

After the available control technologies have been identified, each technology is evaluated with respect to its technical feasibility in controlling emissions from the source in question. The first question in determining whether or not a technology is feasible is whether or not it is demonstrated. If so, it is feasible. Whether or not a control technology is demonstrated is considered to be a relatively straightforward determination.

5.4.2.1. Demonstrated Technology

Demonstrated means that it has been installed and operated successfully elsewhere on a similar facility. If the control technology has been installed and operated successfully on the type of source under review, it is demonstrated and it is technically feasible.[83]

5.4.2.2. Emerging and Undemonstrated Technology

An undemonstrated technology is only technically feasible if it is "available" and "applicable." A control technology or process is only considered available if it has reached the licensing and commercial sales phase of development and is "commercially available."[84] Control technologies in the R&D and pilot scale phases are not considered available. Based on U.S. EPA guidance, an available control technology is presumed to be applicable if it has been permitted or actually implemented by a similar source. Decisions about technical feasibility of a control option consider the physical or chemical properties of the emissions stream in comparison to emissions streams from similar sources successfully implementing the control alternative. The NSR Manual explains the concept of applicability as follows: "An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration."[85] Applicability of a technology is determined by technical judgment and consideration of the use of the technology on similar sources as described in the NSR Manual.

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[81] Upon review of records from the RBLC database, certain corrections were made to the entries as appropriate. For instance, many entries designated as 15.110 Simple Cycle Combustion Turbines were actually Combined Cycle Combustion Turbines or vice versa. In cases where a clear determination could be made based on the project description or other details provided, the RBLC designation code was corrected in the summary tables. Note also that units combusting fuels in addition to natural gas (such as biomass or ethanol blends) have been removed from the summary list.

[82] RBLC searches were performed for both process types will "All Pollutants" selected. The results were then filtered down for each applicable pollutant (PM, NO_X, and GHGs).

[83] NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting, page B.17.

[84] NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting, page B.18.

[85] NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting, page B.18.

5.4.3. Rank of Remaining Control Technologies (Step 3)

All remaining technically feasible control options are ranked based on their overall control effectiveness for the pollutant of interest. For GHGs, this ranking may be based on energy efficiency and/or emission rate.

5.4.4. Evaluation of Most Stringent Control Technologies (Step 4)

After identifying and ranking available and technically feasible control technologies, the economic, environmental, and energy impacts are evaluated to select the best control option. If adverse collateral impacts do not disqualify the top-ranked option from consideration it is selected as the basis for the BACT limit. Alternatively, in the judgment of the permitting agency, if unreasonable adverse economic, environmental, or energy impacts are associated with the top control option, the next most stringent option is evaluated. This process continues until a control technology is identified.

If necessary, economic analyses compare total costs (capital and annual) for potential control technologies. Capital costs include the initial cost of the components intrinsic to the complete control system. Annual operating costs include the financial requirements to operate the control system on an annual basis and include overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique used is based on a factored method of determining direct and indirect installation costs. That is, installation costs are expressed as a function of known equipment costs. This method is consistent with the latest U.S. EPA OAQPS guidance manual on estimating control technology costs.[86]

Total Purchased Equipment Cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical, and electrical components required for the efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the equipment cost. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting and facilities. Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies. Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annual costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Replacement part costs, such as the cost of a replacement catalyst, were included where applicable, while raw material costs were estimated based upon the unit cost and annual consumption. With the exception of overhead, indirect operating costs were calculated as a percentage of the total capital costs. The indirect capital costs were based on the capital recovery factor (CRF) defined as:

[86] U.S. EPA, *OAQPS Control Cost Manual*, 6th edition, EPA 452/B-02-001, July 2002. http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf Note that updated sections of the manual relate to NO_X control costs and are not utilized herein. For more details on the updating of the control cost manual see https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where *i* is the annual interest rate and *n* is the equipment life in years.

The equipment life is based on the normal life of the control equipment and varies on an equipment type basis. The same interest applies to all control equipment cost calculations. For required analyses, an interest rate of 7% was used based on information provided in the most recent OAQPS Control Cost Manual.[87]

5.4.5. Selection of BACT (Step 5)

In the final step, the BACT emission limit is determined for each emission unit under review based on evaluations from the previous step.

Although the first four steps of the top-down BACT process involve technical and economic evaluations of potential control options (i.e., defining the appropriate technology), the selection of BACT in the fifth step involves an evaluation of emission rates achievable with the selected control technology. BACT is an emission limit unless technological or economic limitations of the measurement methodology would make the imposition of an emissions standard infeasible, in which case a work practice or operating standard can be imposed.

5.5. DEFINING THE SOURCE

To assist in meeting the BACT limit, the source must consider production processes or available methods, systems or techniques, as long as those considerations do not redefine the source. Historical practice, as well as recent court rulings, have been clear that a key foundation of the BACT process is that BACT applies to the type of source proposed by the applicant, and that options that would fundamentally redefine the nature of the source is not appropriate in a BACT determination.

Though BACT is based on the type of source as proposed by the applicant, the scope of the applicant's ability to define the source is not absolute. As U.S. EPA notes, a key task for the reviewing agency is to determine which parts of the proposed process are inherent to the applicant's purpose and which parts may be changed without changing that purpose. As discussed by U.S. EPA in an opinion on the Prairie State project,

> *We find it significant that all parties here, including Petitioners, agree that Congress intended the permit applicant to have the prerogative to define certain aspects of the proposed facility that may not be redesigned through application of BACT and that other aspects must remain open to redesign through application of BACT.*[88]
> …
> *When the Administrator first developed* [U.S. EPA's policy against redefining the source] *in* Pennsauken*, the Administrator concluded that permit conditions defining the emissions control systems "are imposed on the source as the applicant has defined it" and that "the source itself is not a condition of the permit.*[89]

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[87] U.S. EPA, OAQPS Control Cost Manual, 6th edition, Section 2, Chapter 1, page 1-52. http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf

[88] EPA Environmental Appeals Board decision, *In re: Prairie State Generating Company*. PSD Appeal No. 05-05, decided August 24, 2006, page 26.

[89] EPA Environmental Appeals Board decision, *In re: Prairie State Generating Company*. PSD Appeal No. 05-05, decided August 24, 2006, page 29.

Given that some parts of the project are not open for review under BACT, U.S. EPA then discusses that it is the permit reviewer's burden to define the boundary. Based on precedent set in multiple prior U.S. EPA rulings (e.g., Pennsauken County Resource Recovery [1988], Old Dominion Electric Coop [1992], Spokane Regional Waste to Energy [1989], U.S. EPA states the following in Prairie State:

> *For these reasons, we conclude that the permit issuer appropriately looks to how the applicant, in proposing the facility, defines the goals, objectives, purpose, or basic design for the proposed facility. Thus, the permit issuer must be mindful that BACT, in most cases, should not be applied to regulate the applicant's objective or purpose for the proposed facility, and therefore, the permit issuer must discern which design elements are inherent to that purpose, articulated for reasons independent of air quality permitting, and which design elements may be changed to achieve pollutant emissions reductions without disrupting the applicant's basic business purpose for the proposed facility.* [90]

U.S. EPA's opinion in Prairie State was upheld on appeal to the Seventh Circuit Court of Appeals, where the court affirmed the substantial deference due the permitting authority on defining the demarcation point.[91]

Taken as a whole, the permitting agency is tasked with determining which controls are appropriate, but the discretion of the agency does not extend to a point requiring the applicant to redefine the source.

OPC T.A. Smith consists of two "2-on-1" power blocks, with each power block consisting of two GE 7FA natural gas combustion turbines, two HRSGs, two natural gas duct burners, and one steam turbine. OPC is considering, as part of AGP Project III, a change to the operational controls at the facility that, if implemented, would increase the capacity of each block by approximately 28.6 MW in the summer and 31.0 MW in the winter (Block 1 being CCCT1 and CCCT2 and steam turbine, and Block 2 being CCCT3 and CCCT4 and steam turbine). These control changes would result in an associated increase in maximum heat inputs and maximum hourly rate of emissions when the duct burners are used at their full capability. Therefore, for this assessment, only Block 1 and Block 2 would be considered modified facility units. The OPC T.A. Smith facility will typically operate as a high capacity factor natural gas-fired electric generating facility, maximizing utilization of the existing assets in a relatively steady-state mode of operation, with normal anticipated variations based on supply needs.

The BACT selections are based on these design constraints, and any potential control methods that would require OPC to redefine these sources has been explained as such, and were not considered further.

5.6. TURBINE SYSTEMS FILTERABLE PM AND TOTAL $PM_{10}/PM_{2.5}$ ASSESSMENT

This section contains a review of pollutant formation, possible control technologies, and the ranking and selection of such controls with associated emission limits, for proposed BACT on particulate related emissions from each combustion turbine system, including the turbine and duct burner associated with the HRSG. The following sections contain details on the "top down" BACT review, as well as the control technology and emission limits selected as BACT for filterable PM and total $PM_{10}/PM_{2.5}$.

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[90] EPA Environmental Appeals Board decision, *In re: Prairie State Generating Company*. PSD Appeal No. 05-05, decided August 24, 2006, Page 30. See also EPA Environmental Appeals Board decision, *In re: Desert Rock Energy Company LLC*. PSD Appeal Nos. 08-03, 08-04, 08-05 & 08-06, decided Sept. 24, 2009, page 64 ("The Board articulated the proper test to be used to [assess whether a technology redefines the source] in *Prairie State*.").

[91] *Sierra Club v. EPA and Prairie State Generating Company LLC*, Seventh Circuit Court of Appeals, No. 06-3907, August 24, 2007. Rehearing denied October 11, 2007.

While BACT emission limits for PM_{10} and $PM_{2.5}$ must include the condensable portion of particulate, most demonstrated control techniques are limited to those that reduce filterable particulate matter. As such, control techniques for filterable PM or PM_{10} also reduce filterable $PM_{2.5}$. The PM BACT analyses for filterable PM and filterable PM_{10} will also satisfy BACT for the filterable portion of $PM_{2.5}$. In the prepared BACT analyses, references to PM_{10} are also relevant for $PM_{2.5}$. A potential source of secondary particulate matter from the proposed projects is due to NO_X emissions from each combustion turbine system. As OPC operates SCR control on each turbine system, secondary PM BACT is effectively addressed by controlling the direct emissions of NO_X. These projects also do not trigger PSD review for the $PM_{2.5}$ precursor SO_2, as project emissions increases are less than the applicable SO_2 SER. As such, secondary PM BACT is not required to be addressed separately.

5.6.1. PM Formation – Turbine Systems

Filterable PM, PM_{10} and $PM_{2.5}$ emissions from natural gas combustion result primarily from incomplete combustion and by ash and sulfur in the fuel.[92] Combustion of natural gas generates low PM emissions in comparison to other fuels due to the low ash and sulfur contents.

In contrast to filterable particulate, condensable particulate is the portion of PM emissions that exhausts from the stack in gaseous form but condenses to form particulate matter once mixed with the cooler ambient air. Condensable particulate results from sulfur in the fuel and the resultant H_2SO_4, NO_X being oxidized to nitric acid (HNO_3), and high molecular weight organics. A combustion turbine operating without an SCR will have lower condensable PM emissions than a similar unit operating with an SCR. The increased condensable result from formation of ammonium sulfates from unreacted ammonia in the control system. Accordingly, emission estimates for total $PM_{10}/PM_{2.5}$ when utilizing an SCR for NO_X emissions reductions are higher than the total $PM_{10}/PM_{2.5}$ emissions anticipated from turbine systems that do not utilize NO_X controls.

5.6.2. Identification of PM Control Technologies – Turbine Systems (Step 1)

The following $PM_{10}/PM_{2.5}$ control technologies were identified based on RBLC search (per the search criteria specified in Section 5.4.1), a limited review of information published in technical journals, and experience in conducting control technology reviews for similar types of equipment. Taking into account the physical and operational characteristics of the units, the candidate control options for particulate matter reduction include:

- Multicyclone
- Wet Scrubber
- Electrostatic Precipitator (ESP)
- Baghouse
- Low sulfur fuel
- Good combustion and operating practices

5.6.2.1. Multicyclone

Multicyclones consist of several small cyclones operating in parallel. The cyclone creates a double vortex inside its shell, conveying centrifugal force on the inlet exhaust stream. The exhaust stream is then forced to move circularly through the cyclone, and the particulate matter in the stream is pushed to the cyclone walls. While this is effective for larger particles, smaller particles tend to be overtaken by the fluid drag force of the air stream and will depart the cyclones with the exiting air stream. The particulate removal in cyclones can be improved by

[92] AP-42, Chapter 1, Section 4, Natural Gas Combustion, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*. April 2000.

having more complex gas flow patterns.[93] The control efficiency range for high efficiency single cyclones is 30 - 90% for PM_{10} and 20 - 70% for $PM_{2.5}$. The use of multicyclones leads to greater PM control efficiency than from a single cyclone, resulting in control efficiencies in the range of 80-95% for particles greater than 5 microns in diameter (PM_5).[94] Multicyclones in parallel can typically handle a higher flowrate when compared to a single cyclone unit, up to approximately 106,000 standard cubic feet per minute (scfm). The allowable inlet gas temperature for a cyclone is limited by the type of construction material, but can be as high as 540°C (1,000°F).[95] Cyclones are generally used as precleaners for final control devices such as fabric filters/baghouses or ESPs due to the lower control efficiency of smaller particles from a cyclone.[96]

5.6.2.2. Wet Scrubber

Wet (in particular, venturi) scrubbers intercept dust particles using droplets of liquid (usually water). The larger, particle-enclosing water droplets are separated from the remaining droplets by gravity. The solid particulates are then separated from the water. The PM collection efficiencies of Venturi scrubbers range from 70% to greater than 99%, depending on the application. Collection efficiencies are generally higher for PM with aerodynamic diameters of approximately 0.5 µm ($PM_{0.5}$) to 5 µm (PM_5). Inlet gas temperatures for wet scrubbers usually range from 4 to 400°C (40 to 750°F), with typical gas flowrates for single-throat scrubbers ranging from 500 to 100,000 scfm.[97]

5.6.2.3. ESP

An ESP removes particles from an air stream by electrically charging the particles then passing them through a force field that causes them to migrate to an oppositely charged collector plate. After the particles are collected, the plates are knocked ("rapped"), and the accumulated particles fall into a collection hopper at the bottom of the ESP. The collection efficiency of an ESP depends on particle diameter, electrical field strength, gas flow rate, gas temperature, and plate dimensions. An ESP can be designed for either dry or wet applications.[98] An ESP can generally achieve approximately 99-99.9% reduction efficiency for PM emissions. Typical ESPs can handle approximately 1,000 to 100,000 scfm, at high temperatures up to 700°C (1,300°F).[99]

5.6.2.4. Baghouse (Fabric Filter)

A baghouse consists of several fabric filters, typically configured in long, vertically suspended sock-like configurations. Particulate laden gas enters from one side, often from the outside of the bag, passing through the filter media and forming a particulate cake. The cake is removed by shaking or pulsing the fabric, which loosens the cake from the filter, allowing it to fall into a bin at the bottom of the baghouse. The air cleaning process stops once the pressure drop across the filter reaches an economically unacceptable level. Typically, the trade-off to frequent cleaning and maintaining lower pressure drops is the wear and tear on the bags suffered in the cleaning process.[100] Typically, gas temperatures up to 260°C (500°F) can be accommodated routinely in a

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[93] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Cyclones, EPA-452/F-03-005.

[94] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Cyclones, EPA-452/F-03-005

[95] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Cyclones, EPA-452/F-03-005

[96] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Cyclones, EPA-452/F-03-005

[97] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Venturi Scrubbers, EPA-452/F-03-017.

[98] Kitto, J.B. *Air Pollution Control for Industrial Boiler Systems.* Barberton, OH: Babcock & Wilcox. November 1996.

[99] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator (ESP) – Wire-Pipe Type, EPA-452/F-03-027.

[100] Kitto, J.B. *Air Pollution Control for Industrial Boiler Systems.* Barberton, OH: Babcock & Wilcox. November 1996.

baghouse. The fabric filters have relatively high maintenance requirements (for example, periodic bag replacement), and elevated temperatures above the designed temperature can shorten the fabric life. Additionally, a baghouse/fabric filter cannot be operated in moist environments where the condensation of moisture could cause the filter to be plugged, reducing efficiency. Under the proper operating conditions, a baghouse can generally achieve approximately 99-99.9% reduction efficiency for PM emissions.[101]

Depending on the need, baghouses are available as standard units from the factory, or custom baghouses designed for specific applications. Standard baghouses can typically handle 100 to 100,000 scfm; while custom baghouses are generally larger, ranging from 100,000 to over 1,000,000 scfm.[102]

5.6.2.5. Low Sulfur Fuels

Exclusively combusting pipeline-quality natural gas with an inherently low sulfur content will reduce particulate emissions compared to other available fuels as there is less potential to form H_2SO_4.

5.6.2.6. Good Combustion and Operating Practices

Good combustion and operating practices imply that the unit is operated within parameters that, without significant control technology, allow the equipment to operate as efficiently as possible.

A properly operated combustion unit will minimize the formation of particulate emissions due to incomplete combustion. Good operating practices typically consist of controlling parameters such as fuel feed rates and air/fuel ratios and periodic tuning.

5.6.3. Elimination of Technically Infeasible PM Control Options – Turbine Systems (Step 2)

All four of the add-on control technologies (multicyclones, wet scrubbers, ESPs, and baghouses) are technically infeasible for filterable particulate from natural gas combustion. Although the add-on control technologies identified are utilized in a number of processes to control particulate emissions, none of these add-on control technologies are applicable to natural gas-fired combustion turbines. Combustion of natural gas generates relatively low levels of particulate emissions in comparison to other fuels due to its low ash and sulfur contents. In addition, turbines operate with a significant amount of excess air, which generates large exhaust flow rates. The low level of particulate emissions combined with the large exhaust gas volume results in very low concentrations of particulate.

Due to the low particulate concentration in the exhaust gas, add-on filterable particulate controls would not provide any significant degree of emission reduction for the combustion turbine systems and are therefore not considered further in this analysis.[103]

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[101] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Fabric Filter – Pulse-Jet Cleaned Type, EPA-452/F-03-025.

[102] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Fabric Filter – Pulse-Jet Cleaned Type, EPA-452/F-03-025.

[103] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of particulates, page 43.

5.6.4. Summary and Ranking of Remaining PM Controls – Turbine Systems (Step 3)

Of the control technologies available for $PM_{10}/PM_{2.5}$ emissions, the options technically feasible for each unit are shown in Table 5-2.

Table 5-2. Remaining Particulate Matter Control Technologies

Control Technology	Technically Feasible for Combustion Turbine
Multicyclones	No
Wet Scrubber	No
ESP	No
Baghouse	No
Low Sulfur Fuel	Yes
Good Combustion and Operating Practices	Yes

As shown in Table 5-2, the remaining feasible control technologies include low sulfur fuels and good combustion and operating practices. Good combustion and operating practices in conjunction with low sulfur natural gas combustion represents the base case for the combustion turbine system, including the turbine and duct burner associated with the HRSG. Therefore, as this is the highest ranking feasible control remaining, it is selected as BACT.

5.6.5. Evaluation of Most Stringent PM Controls – Turbine Systems (Step 4)

As stated previously, good combustion and operating practices with low sulfur natural gas for the combustion turbine systems including the turbine and duct burner associated with the HRSG was determined as the most stringent filterable PM and total $PM_{10}/PM_{2.5}$ control that is a technically feasible option.

5.6.6. Selection of Emission Limits and Controls for PM BACT – Turbine Systems (Step 5)

The combustion turbine systems including the turbine and duct burner associated with the HRSG will not be subject to any NSPS or NESHAP standard for $PM/PM_{10}/PM_{2.5}$ and thus there is no floor of allowable $PM/PM_{10}/PM_{2.5}$ BACT limits. Each individual CCCT system (i.e., combined combustion turbine and duct burner system) is currently subject to a 25 lb/hr filterable PM limit per Condition 3.3.2.c of Permit No. 4911-213-0034-V-08-0, which was the negotiated BACT limit applicable when the systems were originally constructed.[104]

As the selected BACT for particulate matter emissions relies on good combustion and operating practices in conjunction with the use of low sulfur natural gas, OPC searched U.S. EPA's RBLC database for modifications of similar units at other facilities to determine what has been established as a BACT emission requirement for comparable operations. Numerous entries for natural gas CCCT systems are provided in the RBLC summary table in Appendix C. Review of the RBLC entries confirms that add-on control for particulate emissions is not required for natural gas-fired CCCT systems. Typical listings denote "good combustion practices" or similar variants. Some entries may also denote the use of pipeline quality natural gas or inlet air filtration. "Good combustion practices" typically refers to practices inherent in the routine operation and maintenance of the generating unit, such as automated operating systems and periodic tuning of the turbines. While some RBLC

[104] At the time the units were originally permitted, regulatory requirements did not mandate inclusion of condensable PM as part of BACT emission limitations. The established filterable PM limit served as the BACT requirement for TSP and filterable PM_{10}. Permit No. 4911-213-0034-P-01-1, Permit Condition 2.11, effective October 22, 2002.

entries denote the use of pipeline quality natural gas or inlet air filtration, these are typically aspects of the basic design of CCCT systems and do not necessarily require explicit consideration.[105]

Once the technology is established, an emission limitation must be proposed, and review of the RBLC entries provides an indication of what has been considered appropriate BACT emission limitations for potentially similar units as those being modified by OPC T.A. Smith. The majority of the RBLC database entries relate to the installation of new state-of-the-art CCCT systems, not modifications of existing CCCT units. Given the advancements in turbine design and good combustion practices, it is not anticipated that modification of an older generation turbine system would improve combustion efficiency and performance in a manner that would be comparable to installation of a new, state-of-the-art turbine system. Therefore, for comparison purposes, the RBLC entries of interest for OPC T.A. Smith are other potentially modified natural gas combustion turbine systems, summarized in Table 5-3, based on the modification designated in the RBLC entry.

[105] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of particulates, pages 42 – 49.

Table 5-3. Modified Natural Gas Combined Cycle Combustion Turbine RBLC Data

Site	State	New or Modified	Permit Issuance	System Size	Emission Limit (lb/MMBtu)	Emission Limit (lb/hr)	Notes
Hanging Rock, LLC	OH	Modified	10/26/2015	2,045 MMBtu/hr for Turbine Only 2,632 MMBtu/hr for Turbine and DB Combined	0.0050 without DB (TPM) 0.0055 with DB (TPM)	10.2 without DB (TPM) 14.6 with DB (TPM)	Lb/hr limit is for each individual system. Lb/MMBtu is calculated. GE 7FA natural gas fired CCCT. Original equipment installed 2001, modified in 2015. The 2015 modification did not trigger PSD review. Site lowered prior BACT limits and PSD was not triggered.
CPV St. Charles	MD	New/ Modified	4/23/2014	725 MW from Two CCCTs	0.011 with and without DB (TPM_{10})	N/A	Two General Electric 7FA.05 gas-combustion turbines with a nominal generating capacity of 213 MW each. "Modification" of original permit application from 7FA.04 turbines to 7FA.05 units.
CPV St. Charles	MD	Modified	3/16/2018	725 MW from Two CCCTs	0.008 without DB (TPM_{10} and $TPM_{2.5}$) 0.006 with DB (TPM_{10} and $TPM_{2.5}$)	N/A	Two General Electric 7FA.05 gas-combustion turbines with a nominal generating capacity of 213 MW each. The site replaced the existing GE Dry Low-NO_X 2.6 combustors with GE Dry Low-NO_X 2.6+ combustors.
New Covert Generating Facility	MI	Modified	7/30/2018	2,829 MMBtu/hr for Turbine Only 3,085 MMBtu/hr for Turbine and DB Combined	0.00349 with DB (TPM_{10} and $TPM_{2.5}$)	10.7 with DB (TPM_{10} and $TPM_{2.5}$)	Lb/hr limit is for each train. Natural gas fired Mitsubishi model 501G CT. Lb/MMBtu limit is calculated.
Midland Cogeneration Venture	MI	New	4/23/2013	2,237 MMBtu/hr for Turbine Only 2,486 MMBtu/hr for Turbine and DB Combined	0.012 without DB (TPM_{10} and $TPM_{2.5}$) 0.008 with DB (TPM_{10} and $TPM_{2.5}$)	23.4 without DB (TPM_{10}, and $TPM_{2.5}$) 19.9 with DB (TPM_{10}, and $TPM_{2.5}$)	This is a new unit at an existing facility. Per input from the Michigan Department of Environmental Quality, this project has not yet occurred.
Renaissance Power LLC	MI	Modified	11/1/2013	2,147 MMBtu/hr for Turbine Only 2,807 MMBtu/hr for Turbine and DB Combined	0.0042 without DB (TPM_{10} and $TPM_{2.5}$) 0.0073 with DB (TPM_{10} and $TPM_{2.5}$)	9.0 without DB 15.6 with DB	The turbines are existing Westinghouse simple cycle turbines that will be retrofit to be combined cycle units. The hourly limit with duct burning is more restrictive than the lb/MMBtu limit (equivalent lb/MMBtu limit is 0.00556). Per input from the Michigan Department of Environmental Quality, this project did not occur and the Permit to Install was voided.

The following sections detail the various permitting actions identified as modifications in Table 5-3 and highlights the commonalities or differences to the OPC T.A. Smith generating units.

5.6.6.1. Hanging Rock

Duke Energy received a Permit to Install (e.g., a construction permit) for the original Hanging Rock, LLC (Hanging Rock) site in 2001, described as a 1,270 MW Combined Cycle Power Plant consisting of four combined cycle 172 MW natural gas fired GE 7FA turbines with four HRSGs.[106] As OPC T.A. Smith was originally owned by Duke Energy when first permitted, it is reasonable to conclude that the original GE 7FA engines installed at Hanging Rock were similar to those installed/permitted for OPC T.A. Smith. In July 2015, the Hanging Rock facility underwent a permit modification to upgrade the four CCCTs at the site to allow for increased electrical output. The issued permit described the upgraded assets as GE 7FA natural gas fired turbines each with a nominal capacity of 2,045 MMBtu/hr and duct burner nominally rated at 587 MMBtu/hr.[107] The 2015 permitting event was not a PSD major modification; however, the BACT limits established in 2001 for filterable PM/PM_{10} were reduced as part of the 2015 permit modification, presumably to ensure PSD permitting was not required at that time.[108]

Given the facility descriptions, use of GE 7FA engines, and timing of the original construction permitting and subsequent modification, it is reasonable to presume that the Hanging Rock CCCTs are comparable to the units at OPC T.A. Smith. Table 5-4 summarizes the particulate matter emission limits per the original permit and the 2015 modification permit.

Table 5-4. Hanging Rock CCCT Particulate Matter Limits Summary

Permit Year	Unit	Limit	Unit	Pollutant	Basis
2001	CT Only	15	lb/hr	Filterable PM/PM_{10}	Method 5
2015	CT Only	10.2	lb/hr	$PM/PM_{10}/PM_{2.5}$ (Total)	Method 5, 201, 202
2001	CT with DB	23.3	lb/hr	Filterable PM/PM_{10}	Method 5
2015	CT with DB	14.6	lb/hr	$PM/PM_{10}/PM_{2.5}$ (Total)	Method 5, 201, 202

Similar to OPC T.A. Smith, the original 2001 permit presents particulate matter limits in terms of filterable PM/PM_{10} only, relying on a Method 5 test for compliance purposes. The modified permit in 2015 updates the particulate-based limits to reflect the need for total PM_{10} and total $PM_{2.5}$ limitations, as the test method basis includes Method 5, 201 and 202.

Given the equipment similarities, it is reasonable to anticipate that the OPC T.A. Smith units could have a similar emissions profile following the proposed projects as the Hanging Rock units have following their modifications. The existing OPC T.A. Smith permit includes a 25 lb/hr filterable PM limitation on each combustion turbine with duct burner firing resulting from its original permitting action. The equivalent Hanging Rock limit from its 2001 permit is 23.3 lb/hr, supporting this presumption.

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[106] Final Permit to Install 07-00503 issued by the Ohio EPA to Duke Energy – Hanging Rock, LLC, December 13, 2001.

[107] Final Permit to Install P0117322 issued by the Ohio EPA to Hanging Rock Energy Center, July 15, 2015.

[108] Draft Permit to Install P0117322 issued by the Ohio EPA to Hanging Rock Energy Center, June 5, 2015, discussion in permit strategy write-up and permit condition in Section C 1.b)(2)c. Other pollutant BACT limits were also reduced, including NO_X, SO_2, CO, H_2SO_4, and VOC.

As lb/hr emission limits are dependent on the nominal capacity of the CCCTs and the Hanging Rock unit capacities differ somewhat from the OPC T.A. Smith units, OPC converted the Hanging Rock lb/hr limits to approximate equivalent lb/MMBtu values, per the nominal capacities defined in Hanging Rock's 2015 permit, for comparison purposes. These values are summarized in Table 5-5.

Table 5-5. Hanging Rock CCCT Particulate Matter Lb/MMBtu Estimates

Permit Year	Unit	Limit	Unit	Pollutant	Basis
2015	CT Only	0.0050	lb/MMBtu	$PM/PM_{10}/PM_{2.5}$ (Total)	Method 5, 201, 202
2015	CT with DB	0.0055	lb/MMBtu	$PM/PM_{10}/PM_{2.5}$ (Total)	Method 5, 201, 202

If one relies on the Hanging Rock permit limits as a reasonable basis for PM BACT for the OPC T.A. Smith units in terms of the estimated lb/MMBtu, the proposed BACT limit would potentially be equivalent to **0.0055 lb/MMBtu** for operation of the combustion turbine with duct burner. The equivalent OPC T.A. Smith lb/hr rate, based on nominal heat input capacities of 1,859 MMBtu/hr for the combustion turbine and 578 MMBtu/hr for the duct burner is **13.52 lb/hr** for total PM_{10} and total $PM_{2.5}$. If the lb/MMBtu value were rounded to **0.006 lb/MMBtu**, the resulting lb/hr rate would be **14.62 lb/hr**, indicating the importance of significant digits in the derivation of the mass emission rate value.

5.6.6.2. CPV St. Charles

CPV St. Charles (CPV) commenced commercial operation of a natural gas CCCT energy facility with a nominal capacity of 725 MW in 2017.[109] The energy center consists of two GE 7FA natural gas CCCTs. In the original permitting efforts for the facility, CPV anticipated installation of GE 7FA.04 turbines, but subsequently modified their application for installation of GE 7FA.05 turbines, allowing for more efficient and increased MW production.[110] In 2018, CPV St. Charles received a modified order related to replacement of the dry low NO_X GE 2.6 combustors with GE dry low NO_X 2.6+ combustors, alteration of the hours limitations on the duct burners, and other condition updates.[111] While the RBLC database infers the 2014 action as a "modification", it was not a traditional modification of existing equipment or operation, merely a revision of the proposed equipment for installation. Therefore, the CPV equipment represents new turbines, albeit GE 7FA turbines of a more modern design than those installed and operating at OPC T.A. Smith. In light of the turbine type, a review of the BACT limits established for CPV based on the 2014 action is warranted, despite being a new installation. Table 5-6 summarizes the particulate matter emission limits for the CPV St. Charles GE 7FA.05 turbines.

[109] http://www.cpv.com/our-projects/cpv-st-charles/

[110] Environmental Review of the Proposed Modification to the CPV St. Charles Project (Draft), Maryland Department of Natural Resources, PSC Case No. 9280, July 9, 2012.

[111] Proposed Order of Public Utility Law Judge, Case No. 9437, State of Maryland Public Service Commission, dated March 5, 2018. Order was finalized without change on March 16, 2018 and assigned Order No. 88609. Files available at https://www.psc.state.md.us/search-results/?keyword=9437&x.x=9&x.y=18&search=all&search=case

Table 5-6. CPV St. Charles CCCT Particulate Matter Limits Summary

Permit Year	Unit	Limit	Unit	Pollutant	Basis
2014	CT with or without DB	0.007	lb/MMBtu	Filterable PM	Method 5
2014	CT with or without DB	0.011	lb/MMBtu	$PM_{10}/PM_{2.5}$ (Total)	Method 201A and 202
2018	CT Only	0.005	lb/MMBtu	Filterable PM	Method 5
2018	CT Only	0.008	lb/MMBtu	$PM_{10}/PM_{2.5}$ (Total)	Method 201A and 202
2018	CT with DB	0.004	lb/MMBtu	Filterable PM	Method 5
2018	CT with DB	0.006	lb/MMBtu	$PM_{10}/PM_{2.5}$ (Total)	Method 201A and 202

An interesting contrast between the Hanging Rock emission limits and the CPV St. Charles emissions limits is the difference between the limits when the duct burner is included. For Hanging Rock, the estimated lb/MMBtu increases when the duct burner is firing, whereas for CPV St. Charles, the lb/MMBtu permit limits decrease when the duct burner is included. There are multiple factors which may be influencing the established limit such as the typical operating scenario anticipated for duct burner firing (time of year, resulting atmospheric conditions) and the size of the duct burners themselves (the Hanging Rock units are larger than the CPV St. Charles units). In all, the resulting limit for total $PM_{10}/PM_{2.5}$ for the combustion turbine with duct burner firing scenario based on the 2018 modification permit is reasonably equivalent between the two sites, **0.006 lb/MMBtu**, which would result in a **14.62 lb/hr** mass emission rate for each of the OPC T.A. Smith units (combustion turbine with duct burner). Note however that the hourly mass emission rate increases to **14.87 lb/hr** for each of the OPC T.A. Smith combustion turbines (no duct burner firing) when relying on the **0.008 lb/MMBtu** turbine-only limit from the 2018 modification.

However, the limit that has been demonstrated as a result of the CPV units commencing operation in 2017 and is most comparable to the OPC T.A. Smith units would be based on the 2014 permit, **0.011 lb/MMBtu**, resulting in a **26.81 lb/hr** total $PM_{10}/PM_{2.5}$ mass emission rate for the OPC T.A. Smith units (combustion turbine with duct burner).

5.6.6.3. New Covert Generating Facility

The New Covert Generating Facility received a modification permit in July 2018. The Permit to Install indicates that the existing natural gas CCCT systems at the facility were originally installed in 2001, similar to the timing of OPC T.A. Smith units. However, while the timing is similar, the installed turbines at New Covert Generating are Mitsubishi model 501G units, with emission profiles of a different nature than the GE 7FA turbine. Following the completion of the planned modification, the permit defined heat input capacity of each combustion turbine will be 2,829 MMBtu/hr, with a duct burner heat input basis of 256 MMBtu/hr (HHV).[112] The permit establishes a total $PM_{10}/PM_{2.5}$ emission limit of 10.7 lb/hr, estimated to be equivalent to **0.00346 lb/MMBtu** based on the listed HHV heat input capacities for the CT with duct burner firing. Given the unique emission profiles associated with the manufacturer design of different natural gas CCCT units, OPC T.A. Smith maintains that the New Covert generating facility BACT limit for a Mitsubishi model turbine is not an appropriate limitation for a GE 7FA turbine.

[112] Permit to Install 186-17 issued by the Michigan Department of Environmental Quality, July 30, 2018.

5.6.6.4. Midland Cogeneration Venture

Midland Cogeneration Venture (Midland) received a permit for installation of new natural gas CCCTs at an existing facility in 2013. Per input from the Michigan Department of Environmental Quality, the permit allowed for the installation of either GE 7FA.05 or Siemens SGT6-5000F turbines. The proposed project has not been completed to-date. A summary of the particulate matter BACT limits established for Midland is presented in Table 5-7 given the proposed project included the possible installation of a GE 7FA.05 turbine.[113]

Table 5-7. Midland CCCT Particulate Matter Limits Summary

Unit	Limit	Unit	Pollutant	Basis
CT Only	0.0060	lb/MMBtu	Filterable PM	Method 5
CT Only	0.0120	lb/MMBtu	$PM_{10}/PM_{2.5}$ (Total)	Method 201A and 202
CT with DB	0.0040	lb/MMBtu	Filterable PM	Method 5
CT with DB	0.0080	lb/MMBtu	$PM_{10}/PM_{2.5}$ (Total)	Method 201A and 202

While the Midland permit is for a new turbine system, the BACT emission limits for combustion turbines with duct burner firing are higher than the emission limits reviewed for Hanging Rock and CPV St. Charles (2018 modification). The Midland limits are comparable to the 2014 CPV St. Charles limit of 0.011 lb/MMBtu for the turbines with or without duct burner firing, likely given the possibility of installation of a GE 7FA.05 turbine. The turbine with duct burner limit of **0.0080 lb/MMBtu** total $PM_{10}/PM_{2.5}$ results in a **19.50 lb/hr** mass rate for each of the OPC T.A. Smith units; the turbine-only limit of **0.012 lb/MMBtu** total $PM_{10}/PM_{2.5}$ results in a **22.31 lb/hr** mass emission rate for each of the OPC T.A. Smith units.

5.6.6.5. Renaissance Power, LLC

This proposed modification involved the retrofit of existing simple cycle combustion turbines to combined cycle units. The existing turbines are Westinghouse units. The project did not occur and the Michigan Department of Environmental Quality has voided the permit to install. In light of all these factors, the Renaissance Power entries are not considered further in these BACT analyses.

5.6.6.6. Summary

The anticipated BACT for filterable PM, total $PM_{10}/PM_{2.5}$ would be good combustion practices and the use of low sulfur natural gas. Table 5-8 summarizes the BACT limits for total $PM_{10}/PM_{2.5}$ for potentially comparable units in terms of lb/MMBtu, with the resulting lb/hr mass emission rate that would apply to the OPC T.A. Smith units, broken down by turbine alone or turbine with duct burner firing. For the turbine alone, the estimated mass emission rates range between 9.27 lb/hr to 26.81 lb/hr; for the turbine with duct burner firing, the range is between 13.52 lb/hr to 26.81 lb/hr.

[113] Renewable operating permit No. MI-ROP-B6527-2014a, revised June 16, 2016, for Midland Cogeneration Venture Limited Partnership. Permit issued by the Michigan Department of Environmental Quality.

Table 5-8. Summary of Reviewed Total PM_{10}/Total $PM_{2.5}$ BACT Limits

Site	Unit	Total $PM_{10}/PM_{2.5}$ (lb/MMBtu)	Equivalent OPC Smith Limit (lb/hr)
Hanging Rock	CT	0.005	9.27
CPV 2014	CT	0.011	26.81
CPV 2018	CT	0.008	14.87
Midland	CT	0.012	22.31
Hanging Rock	CT w/ DB	0.0055	13.52
CPV 2014	CT w/ DB	0.011	26.81
CPV 2018	CT w/ DB	0.006	14.62
Midland	CT w/ DB	0.008	19.50

OPC is proposing a BACT limit that, while not being the lowest value for other similarly modified units, is within the range of BACT limitations. As the operation of the SCR contributes to condensable PM formation, and OPC T.A. Smith has not been required to conduct performance testing that includes condensable PM, OPC has uncertainty about the anticipated magnitude of condensable PM emissions. Based on a review of the modified units in the RBLC database, OPC proposes a BACT emission limit for each CCCT system of **19.5 lb/hr** for filterable PM and total $PM_{10}/PM_{2.5}$, equivalent to an emission rate of **0.008 lb/MMBtu**. As the OPC T.A. Smith units are presently subject to a filterable PM limit of 25 lb/hr, a limit of 19.5 lb/hr for filterable PM and total $PM_{10}/PM_{2.5}$ is a clear reduction in allowable emissions as it restricts both filterable and condensable PM emissions to a lower value, despite the increase in power output. Compliance with this BACT limit will be demonstrated by stack testing via U.S. EPA Method 5 and/or 201A in conjunction with Method 202 or alternative methods as appropriate.

Secondary BACT limits are not proposed as the particulate emissions of the turbine systems are not considered to be dependent on control measures with varying effectiveness.

5.7. TURBINE SYSTEMS NO_X ASSESSMENT

This section contains a review of pollutant formation, possible control technologies, and the ranking and selection of such controls with associated emission limits, for proposed BACT on NO_X emissions from each combustion turbine system, including the turbine and duct burner associated with the HRSG. The following sections contain details on the "top down" BACT review, as well as the control technology and emission limits that are selected as BACT for NO_X.

5.7.1. NO_X Formation – Turbines Systems

There are five (5) primary pathways of NO_X production in gas-fired combustion turbine combustion processes: thermal NO_X, prompt NO_X, NO_X from N_2O intermediate reactions, fuel NO_X, and NO_X formed through reburning. The three most important mechanisms are thermal NO_X, prompt NO_X, and fuel NO_X.[114] Because the turbines fire natural gas exclusively, thermal NO_X is the primary NO_X generating mechanism for the OPC T.A. Smith units. Thermal NO_X is formed mainly via the Zeldovich mechanism where the nitrogen (N_2) and oxygen (O_2) molecules

[114] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

in the combustion air react to form nitrogen monoxide (NO).[115] Most thermal NO_X is formed in high temperature flame pockets downstream from the fuel injectors.[116] Temperature is the most important factor, and at combustion temperatures above 2,370°F, thermal NO_X is formed readily.[117] Therefore, reducing combustion temperature is a common approach to reducing NO_X emissions.

Prompt NO_X, a form of thermal NO_X, is formed in the proximity of the flame front as intermediate combustion products such as hydrogen cyanide (HCN), N, and NH are oxidized to form NO_X.[118] The contribution of prompt NO_X to overall NO_X is relatively small but increases in low-NO_X combustor designs. Prompt NO_X formation is also largely insensitive to changes in temperature and pressure.[119]

Fuel NO_X forms when fuels containing nitrogen are burned. When these fuels are burned, the nitrogen bonds break and some of the resulting free nitrogen oxidizes to form NO_X. With excess air, the degree of fuel NO_X formation is primarily a function of the nitrogen content of the fuel. Therefore, since natural gas contains little fuel bound nitrogen, fuel NO_X is not a major contributor to NO_X emissions from natural gas-fired combustion turbines.[120]

In general, technology and emissions performance data could be limited to those turbines within the size range of typical CCCT units, and specifically those size of turbines in operation at OPC T.A. Smith. U.S. EPA has, in support of federal regulations such as the NSPS for combustion turbines (NSPS Subpart KKKK), reviewed the NO_X emissions performance data for combustion turbines of all sizes and found differing performance data for turbines based on the size of the unit. As quoted by U.S. EPA, per 70 FR 8318 (2/18/05);

> *We identified a distinct difference in the technologies and capabilities between small and large turbines…. the smaller combustion chamber of small turbines provides inadequate space for the adequate mixing needed for very low NO_X emission levels.*

U.S. EPA finalized NSPS Subpart KKKK with a breakpoint in consideration of turbine sizes greater than 850 MMBtu/hr, between 50 MMBtu/hr and 850 MMBtu/hr, and less than 50 MMBtu/hr. Since the OPC units are above the 850 MMBtu/hr size range, only units greater than 850 MMBtu/hr are truly comparable, since as identified by U.S. EPA, there are inherent design differences in units at that size and above that can lead to inherently lower NO_X emission levels. However, OPC did not limit the review of RBLC entries.

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[115] U.S. EPA, Emission Standards Division, *Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines*, EPA-453/R-93-007. January 1993.

[116] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

[117] U.S. EPA, Clean Air Technology Center, *Technical Bulletin: Nitrogen Oxides (NO_X), Why and How They are Controlled*, EPA 456/F-99-006R. November 1999.

[118] U.S. EPA, Emission Standards Division, *Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines*, EPA-453/R-93-007. January 1993.

[119] U.S. EPA, Emission Standards Division, *Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines*, EPA-453/R-93-007. January 1993.

[120] U.S. EPA, Emission Standards Division, *Alternative Control Techniques Document - NO_X Emissions from Stationary Gas Turbines*, EPA-453/R-93-007. January 1993.

NO_X emissions are a potential contributor to secondary particulate formation. Since OPC is conducting a top-down BACT analysis for NO_X for the proposed projects, secondary PM BACT is effectively addressed by controlling the direct emissions of NO_X. As such, secondary PM BACT is not separately addressed.

5.7.2. Identification of NO_X Control Technologies – Turbine Systems (Step 1)

NO_X reduction can be accomplished by two general methodologies: combustion control techniques and post-combustion control methods. Combustion control techniques incorporate fuel or air staging that affect the kinetics of NO_X formation (reducing peak flame temperature) or introduce inerts (combustion products, for example) that limit initial NO_X formation, or both. Several post-combustion NO_X control technologies could potentially be employed for the OPC T.A. Smith turbines. These technologies use various strategies to chemically reduce NO_X to N_2 with or without the use of a catalyst.

Detailed tables of BACT determinations from the RBLC database are provided in Appendix C. Using the RBLC search, as well as a review of technical literature, potentially applicable NO_X control technologies for turbines were identified based on the principles of control technology and engineering experience for general combustion units.

Combustion control options include:[121]

- Water or Steam Injection
- Dry Low-NO_X (DLN) Combustion Technology (such as SoLoNO$_X$™)
- Good Combustion Practices (Base Case)

Post-combustion control options include:

- EM$_X$™/SCONO$_X$™ Technology
- Selective Catalytic Reduction (SCR)
- SCR with Ammonia Oxidation Catalyst (Zero-Slip™)
- Selective Non-Catalytic Reduction (SNCR)
- Multi-Function Catalyst (METEOR™)

Each control technology is described in detail in the following sections.

5.7.2.1. Water or Steam Injection

Water or steam injection operates by introducing water or steam into the flame area of the gas turbine combustor. The injected fluid provides a heat sink that absorbs some of the heat of combustion, thereby reducing the peak flame temperature and reducing the formation of thermal NO_X. The water injected into the turbine must be of high purity such that no dissolved solids are injected into the turbine. Dissolved solids in the water may damage the turbine due to erosion and/or the formation of deposits in the hot section of the turbine. Although water/steam injection can reduce NO_X emissions by over 60%, the lower average temperature within the combustor may produce higher levels of CO and VOC as a result of incomplete combustion.[122] Additionally,

[121] An additional combustion control technology potentially identified was XONON which was offered by Catalytica Energy Systems. Catalytica merged with NZ Legacy in 2007 to form Renergy Holdings Inc. In November 2007, Renergy sold its SCR catalyst and management services business (SCR-Tech, LLC). SCR-Tech, LLC was acquired by Steag Energy Services, LLC in 2016. Based on research, there is no company which currently makes XONON. As such, it is not considered available for this BACT analysis.

[122] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

water/stream injection results in a decrease in combustion efficiency, an increase in power (due to increased mass flow), and an increase in maintenance requirements due to wear.[123]

5.7.2.2. Dry Low-NO_X (DLN) Combustors

The lean premix technology, also referred to as dry low-NO_X combustion technology, is a pollution prevention technology that minimizes NO_X emissions by reducing the conversion of atmospheric nitrogen to NO_X in the turbine combustor. This is accomplished by reducing the combustor temperature using lean mixtures of air and/or fuel staging or by decreasing the residence time of the combustor.[124] In lean combustion systems, excess air is introduced into the combustion zone to produce a significantly leaner fuel/air mixture than is required for complete combustion. This excess air decreases the overall flame temperature because a portion of the energy released from the fuel must be used to heat the excess air to the reaction temperature. Pre-mixing the fuel and air prior to introduction into the combustion zone provides a uniform fuel/air mixture and prevents localized high temperature regions within the combustor area.[125] Since NO_X formation rates are an exponential function of temperature, a considerable reduction in NO_X can be achieved by the lean pre-mix system.[126] Depending on the manufacturer and product, different levels of control efficiencies can be achieved.

5.7.2.3. Good Combustion Practices

Good combustion practices are those, in the absence of control technology, which allow the equipment to operate as efficiently as possible. The operating parameters most likely to affect NO_X emissions include ambient temperature, fuel characteristics, and air-to-fuel ratios.

5.7.2.4. EM_X^{TM}/$SCONO_X$

EM_X^{TM} (the second-generation of the $SCONO_X$ NO_X Absorber Technology) is a multi-pollutant control technology that utilizes a coated oxidation catalyst to remove both NO_X and CO without a reagent, such as ammonia (NH_3). The $SCONO_X$ system consists of a platinum-based catalyst coated with potassium carbonate [$K_2(CO_3)$] to oxidize NO_X (to potassium nitrate [$K(NO_3)$]) and CO (to CO_2).[127] Hydrogen (H_2) is then used as the basis for the catalyst regeneration process where $K(NO_3)$ is reacted to reform the $K_2(CO_3)$ catalyst and release nitrogen gas and water.[128] The catalyst is installed in the flue gas with a temperature range between 300°F to 700°F. The $SCONO_X$ catalyst is susceptible to fouling by sulfur if the sulfur content of the flue gas is high.[129]

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[123] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

[124] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

[125] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

[126] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*, July 1998, and AP-42, Chapter 3, Section 1, *Stationary Gas Turbines*, April 2000.

[127] Georgia EPD, *Prevention of Significant Air Quality Deterioration Review Preliminary Determination – Dahlberg Combustion Turbine Electric Generating Facility*, October 2009. https://epd.georgia.gov/air/sites/epd.georgia.gov.air/files/related_files/document/1570034pd.pdf

[128] Ibid. (Georgia EPD)

[129] California Energy Commission, *Evaluation of Best Available Control Technology*, Appendix 8.1E, pages 8.1E-9 and 8.1E-10.

Estimates of control efficiency for a SCONO$_X$ system vary depending on the pollutant controlled. California Energy Commission reports a control efficiency of 78% for NO$_X$ reductions down to 2.0 ppm, and even higher NO$_X$ reductions down to 1 ppm for some designs.[130]

5.7.2.5. Selective Catalytic Reduction (SCR)

SCR is a post-combustion gas treatment process in which NH_3 is injected into the exhaust gas upstream of a catalyst bed. On the catalyst surface, NH_3 and NO react to form diatomic N_2 and H_2O vapor. The overall chemical reaction can be expressed as:

$$4\ NO + 4\ NH_3 + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$

When operated within the optimum temperature range, the reaction can result in removal efficiencies between 70 and 90 percent.[131] Optimal temperatures for SCR units ranges from 480°F to 800°F and typical SCR systems have the ability to function effectively under temperature fluctuations of up to 200°F.[132] SCR can be used to reduce NO$_X$ emissions from combustion of natural gas and light oils (e.g., distillate). Combustion of heavier oils can produce high levels of particulate, which may foul the catalyst surface, reducing the NO$_X$ removal efficiency.[133] Other considerations include the possibility for ammonia slip, which refers to emissions of unreacted ammonia escaping with the flue gas and its contribution to secondary particulate formation.[134]

5.7.2.6. SCR with Ammonia Oxidation Catalyst (Zero-Slip™)

SCR with Ammonia Oxidation Catalyst (Zero-Slip™) is a refinement on standard post-combustion SCR technology developed by Cormetech and Mitsubishi Power Systems to reduce ammonia slip associated with traditional SCR systems. The Zero-Slip™ technology consists of a second bed of catalyst that is installed after the main SCR catalyst to further react NO$_X$ with the ammonia. This results in NO$_X$ emissions on par with standard SCR systems and less ammonia slip (less than 2.0 ppmvd at 15% O_2).[135]

5.7.2.7. Selective Non-Catalytic Reduction (SNCR)

SNCR is a post-combustion NO$_X$ control technology based on the reaction of urea or ammonia with NO$_X$. In the SNCR chemical reaction, urea [$CO(NH_2)_2$] or ammonia is injected into the combustion gas path to reduce the NO$_X$ to nitrogen and water. The overall reaction schemes for both urea and ammonia systems can be expressed as follows:

$$CO(NH_2)_2 + 2\ NO + ½\ O_2 \rightarrow 2\ N_2 + CO_2 + 2\ H_2O$$

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[130] California Energy Commission, *Evaluation of Best Available Control Technology*, Appendix 8.1E, page 8.1E-6.

[131] U.S. EPA, Clean Air Technology Center, *Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR)*, EPA-452/F-03-032.

[132] U.S. EPA, Clean Air Technology Center, *Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR)*, EPA-452/F-03-032.

[133] U.S. EPA, Clean Air Technology Center, *Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR)*, EPA-452/F-03-032.

[134] U.S. EPA, Clean Air Technology Center, *Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction (SCR)*, EPA-452/F-03-032.)

[135] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO$_X$, Attachment B pages 13-14.

$$4\ NH_3 + 6NO \rightarrow 5\ N_2 + 6\ H_2O$$

Typical removal efficiencies for SNCR range from 30 to 50 percent and higher when coupled with combustion controls.[136] An important consideration for implementing SNCR is the operating temperature range. The optimum temperature range is approximately 1,600 to 2,000°F.[137] Operation at temperatures below this range results in ammonia slip. Operation above this range results in oxidation of ammonia, forming additional NO_X.

5.7.2.8. Multi-Function Catalyst (METEOR™)

METEOR™ is a multi-pollutant post-combustion control technology originally developed and patented by Siemens Energy Inc., and optimized by Cormetech. The METEOR™ catalyst uses ammonia, similar to standard SCR systems, to reduce NO_X emissions but is also able to reduce CO, VOC, and ammonia emissions using a single catalyst bed (i.e., eliminate the need for a separate oxidation catalyst system if CO and VOC reductions are required), resulting in reduced pressure drop and parasitic load requirements.[138] The ability of the METEOR™ catalyst to reduce NO_X emissions is on par with more traditional SCR designs.[139]

5.7.3. Elimination of Technically Infeasible NO_X Control Options – Turbine Systems (Step 2)

After the identification of potential control options, the second step in the BACT assessment is to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control, if a control technology has not been commercially demonstrated to be achievable, or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits.

5.7.3.1. Water or Steam Injection Feasibility

Water or steam injection is a NO_X reduction technology that is commonly used to control NO_X emissions when fuel oil is burned, but is not as effective as DLN combustors when firing natural gas.[140] Water or steam injection also cannot be used in conjunction with DLN because it leads to unstable combustion and increases CO emissions.[141] Since the OPC T.A. Smith turbines exclusively fire natural gas and currently have DLN combustors that reduce NO_X emissions further than water or steam injection would, water or steam injection is deemed to be infeasible.

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[136] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Selective Non -Catalytic Reduction (SNCR), EPA-452/F-03-031.

[137] U.S. EPA, Clean Air Technology Center, Air Pollution Control Technology Fact Sheet: Selective Non -Catalytic Reduction (SNCR), EPA-452/F-03-031.

[138] Siemens Energy and Cormetech, *Capital and O&M Benefits of Advanced Multi-Function Catalyst Technology for Combustion Turbine Power Plants,* Power Gen 2015, page 2.

[139] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B pages 15-16.

[140] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 12.

[141] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 12.

5.7.3.2. Dry Low NO_X Combustion Technology Feasibility

Dry low NO_X combustion technology is a NO_X control technology that is integral to the combustion turbine. It is determined to be technically feasible for the combustion turbine itself, and is currently installed on the OPC T.A. Smith units. Therefore, DLN combustion technology is included in the following BACT steps, but represents part of the base case for NO_X performance as it is inherent in the operation of the combustion systems.

5.7.3.3. Good Combustion Practices Feasibility

Good combustion practices are those that allow equipment to operate as efficiently as possible and maintain minimal emission releases with or without the operation of other control technologies. This is considered technically feasible for the minimization of NO_X emissions from the turbines.

5.7.3.4. EM_X™/$SCONO_X$™ Technology Feasibility

As summarized by Illinois EPA in their project summary for the Jackson Energy Center PSD permit, the EM_X™/$SCONO_X$™ catalyst system has operated successfully on several smaller, natural gas-fired units, but there are engineering challenges with applying this technology to larger plants with full scale operation. To date, this technology has not been installed and operated on a large combined-cycle operation.[142] Consequently, it is concluded that EM_X™/$SCONO_X$™ is not technically feasible for control of NO_X emissions from the OPC T.A. Smith turbines.

5.7.3.5. SCR Feasibility

The OPC T.A. Smith units currently operate SCR for NO_X control. Therefore, it is considered technically feasible and included in the following BACT steps.

5.7.3.6. SCR with Ammonia Oxidation Catalyst (Zero-Slip™) Feasibility

Based on OPC's review of available control technologies, to date, the Zero-Slip™ catalyst technology has not been demonstrated on large, utility-size CCCT units, with full scale operation demonstrated on a 7.5 MW Solar Taurus combustion turbine.[143] As the technology has not been demonstrated on large, utility size units, and it would not achieve NO_X emission rates lower than that achieved by conventional SCR designs (presently installed on the OPC T.A. Smith units), the Zero-Slip™ technology option is not considered a technically feasible control option.

5.7.3.7. SNCR Feasibility

The temperature range required for effective operation of this technology, 1,600 to 2,000°F, is above the peak exhaust temperature for the OPC T.A. Smith units.[144] In addition, a review of the RBLC database and AP-42's supplemental database for Chapter 3.1, *Stationary Gas Turbines*, April 2000, shows that SNCR has not been demonstrated on a turbine of this size. Given the changes to adapt units for use of SNCR, such as adding a flue gas heater, are not practical, reduces the energy efficiency of combined-cycle generating units, and would not

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[142] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B pages 14.

[143] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 14.

[144] Ibid. (SNCR Fact Sheet)

provide control superior to the installed SCR system, SNCR is eliminated as a technically feasible option for control of NO_X emissions from the OPC T.A. Smith turbine systems.

5.7.3.8. Multi-Function Catalyst (METEOR™) Feasibility

The METEOR™ catalyst technology, developed and patented by Siemens Energy Inc., is currently only in use on one 320 MW Siemens/Westinghouse 501G combustion turbine installed in November 2015.[145,146] A review of the RBLC database for CCCT similar to OPC T.A. Smith units did not return any units that use the METEOR™ catalyst technology. As there is limited commercial operating experience with the METEOR™ catalyst, and it would not achieve NO_X emission rates lower than that achieved by conventional SCR designs (presently installed on the OPC T.A. Smith units), the METEOR™ technology option is not considered a technically feasible control option for purposes of BACT.

5.7.4. Summary and Ranking of Remaining NO_X Controls – Turbine Systems (Step 3)

Of the control technologies available for NO_X emissions, the options technically feasible for each unit are shown in Table 5-9.

Table 5-9. Remaining NO_X Control Technologies

Control Technology	Technically Feasible for Turbine Systems
Water or Steam Injection	No
DLN Combustion Technology	Yes
Good Combustion Practice	Yes
EM_X™/$SCONO_X$™ Technology	No
SCR	Yes
SCR with Zero-Slip™	No
SNCR	No
METEOR™	No

As shown in Table 5-9, the remaining feasible control technologies include SCR, DLN combustors, and good combustion practices. The OPC T.A. Smith units already operate an SCR system and utilize DLN combustors. OPC will also continue to implement good combustion practices once the proposed projects are complete. Therefore, as these are the feasible controls remaining, they will continue to be operated and are selected as BACT.

5.7.5. Evaluation of Most Stringent NO_X Controls – Turbine Systems (Step 4)

As stated previously, SCR, DLN combustors, and good combustion practices remain the most stringent NO_X controls that are technically feasible options for the OPC T.A. Smith turbine systems.

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[145] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 16.

[146] Siemens Energy and Cormetech, *Capital and O&M Benefits of Advanced Multi-Function Catalyst Technology for Combustion Turbine Power Plants,* Power Gen 2015, page 2.

5.7.6. Selection of Emission Limits and Controls for NO_X BACT – Turbine Systems (Step 5)

Once the proposed modifications are complete, the combustion turbine systems will be subject to an NSPS Subpart KKKK NO_X emission standard of 15 ppm at 15% O_2 or 0.43 lb/MWh useful output. Therefore, 15 ppm at 15% O_2 serves as the floor for allowable NO_X BACT limits. Each individual combined cycle combustion turbine with HRSG and duct burner system is presently subject to a NO_X limit of 3.0 ppm at 15% O_2 per Condition 3.3.2.a of Permit No. 4911-213-0034-V-08-0, the BACT limit established when the site was initially constructed.

As the selected BACT for NO_X emissions relies on an SCR system, DLN combustors, and good combustion practices, OPC searched U.S. EPA's RBLC database for modifications of similar units at other facilities to determine what has been established as a BACT emission requirement for comparable operations. Numerous entries for natural gas CCCT systems are provided in the RBLC summary table in Appendix C. Review of the RBLC entries confirms that controls for NO_X emissions are typically SCR systems, DLN combustors, and good combustion practices for natural gas CCCT systems (or similar variants). Some entries may also denote the use of water or steam injection which was previously ruled technically infeasible for the OPC T.A. Smith units. "Good combustion practices" typically refers to practices inherent in the routine operation and maintenance of the generating unit, such as automated operating systems and periodic tuning of the turbines.

Once the technology is established, an emission limitation must be proposed, and review of the RBLC entries provides an indication of what has been considered appropriate BACT emission limitations for potentially similar units as those being modified by OPC T.A. Smith. The majority of the RBLC database entries relate to the installation of new state-of-the-art CCCT systems, not modifications of existing CCCT units. Given the advancements in turbine design and control systems, it is not anticipated that modification of an older generation turbine system would improve combustion efficiency, controls and performance in a manner that would be comparable to installation of a new, state-of-the-art turbine and controls system. Therefore, for comparison purposes, the RBLC entries of interest for OPC T.A. Smith are ones listed as modified natural gas combustion turbine systems, summarized in Table 5-10.

Table 5-10. Modified Natural Gas Combined Cycle Combustion Turbine RBLC Data

Site	State	New or Modified	Permit Issuance	System Size	Emission Limit (ppmvd @ 15% O_2)	Averaging Period	Notes
Hanging Rock, LLC	OH	Modified	10/26/2015	2,045 MMBtu/hr for Turbine Only 2,632 MMBtu/hr for Turbine and DB Combined	2.9	3-hour block average	GE 7FA natural gas fired CCCTs equipped with Dry Low NO_X burners and SCR. RBLC entry is 3 ppmvd @ 15% O_2, a review of the final permit shows that this was changed to 2.9 ppmvd @ 15% O_2, excluding startup and shutdown. Original equipment installed 2001, modified in 2015. The 2015 modification did not trigger PSD review. Site lowered prior BACT limits and PSD was not triggered.
CPV St. Charles	MD	New/ Modified	4/23/2014	725 MW from Two CCCTs	2.0	3-hour block average	Two General Electric 7FA.05 gas-combustion turbines with a nominal generating capacity of 213 MW each. "Modification" of original permit application from 7FA.04 turbines to 7FA.05 units.
CPV St. Charles	MD	Modified	3/16/2018	725 MW from Two CCCTs	2.0	3-hour block average	Two General Electric 7FA.05 gas-combustion turbines with a nominal generating capacity of 213 MW each. The site replaced the existing GE Dry Low-NO_X 2.6 combustors with GE Dry Low-NO_X 2.6+ combustors.
New Covert Generating Facility	MI	Modified	7/30/2018	2,829 MMBtu/hr for Turbine Only 3,085 MMBtu/hr for Turbine and DB Combined	2.0	24-hour rolling average	Natural gas fired Mitsubishi model 501G CT. Turbines equipped with Dry Low NO_X burners and SCR. Limit excludes startup and shutdown.
Midland Cogeneration Venture	MI	New	4/23/2013	2,237 MMBtu/hr for Turbine Only 2,486 MMBtu/hr for Turbine and DB Combined	2.0	24-hour rolling average	This is a new unit at an existing facility. Limit excludes startup and shutdown. Turbines equipped with Dry Low NO_X burners and SCR. . Per input from the Michigan Department of Environmental Quality, this project has not yet occurred.
Renaissance Power LLC	MI	Modified	11/1/2013	2,147 MMBtu/hr for Turbine Only 2,807 MMBtu/hr for Turbine and DB Combined	2.0	3-hour rolling average	The turbines are existing Westinghouse simple cycle turbines that will be retrofit to be combined cycle units. Turbines equipped with Dry Low NO_X burners and SCR. Limit excludes startup and shutdown. Per input from the Michigan Department of Environmental Quality, this project did not occur and the Permit to Install was voided.
High Desert Power Project	CA	Modified	3/11/2010	1,711 MMBtu/hr for Turbine Only 1,871 MMBtu/hr for Turbine and DB Combined	2.5	1-hour block average	The turbines are existing combined cycle Westinghouse 501F turbines. Turbines equipped with Dry Low NO_X burners and SCR. Limit excludes startup and shutdown.

The RBLC entries detailed in Table 5-10 include the same modifications at facilities that were discussed in Section 5.6.6 with the addition of the High Desert Power Project, LLC facility in Victorville, California.[147] A review of the proposed control technologies for these facilities show that all seven required a combination of SCR, DLN combustors, and good combustion practices as BACT. OPC already operates an SCR system, DLN combustors, and implements good combustion practices on the turbine systems and will continue to operate those control systems as BACT for the turbines.

As discussed in detail in Section 5.6.6, there are various factors as to why, even with the use of the same control technologies, the emissions limits presented for the facilities in Table 5-10 are not necessarily directly comparable to the OPC T.A. Smith units. Table 5-11 summarizes whether the RBLC listing was actually for a new unit or a modification of a unit, if the turbine involved was a GE turbine, and whether the facilities in Table 5-10 are comparable to the OPC T.A. Smith units based on these factors.

Table 5-11. Unit Comparability for NO_X Assessment

Site	New/ Modified	GE Turbine?	Comparable?	NO_X Limit (ppmvd @ 15% O_2)
Hanging Rock	Modified	Yes	Yes	2.9
CPV 2014	New	Yes	Maybe	2.0
CPV 2018	Modified	Combustor Replacement	No	N/A
New Covert	Modified	No	No	N/A
Midland	New	Maybe	Maybe	2.0
Renaissance	Modified	No	No	N/A
High Desert	Modified	No	No	N/A

The Midland Cogeneration Venture has not yet occurred and the Renaissance Power, LLC project was voided. The New Covert Generating Facility and the High Desert Power Project all use non-GE combustion turbines. The CPV St. Charles facility does use GE model turbines, but a newer design (GE 7FA.05) relative to OPC's units. The most similar units to OPC T.A. Smith are those at the Hanging Rock facility, having initially been permitted in 2001, with a modification in 2015. Hanging Rock units presently are limited to 2.9 ppmvd of NO_X at 15% O_2 with a 3-hour block averaging period.

As discussed in Section 5.2.4, BACT is to be set at the lowest value that is achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life. OPC maintains that although NO_X levels below 2.9 ppm at 15% O_2 can be achieved by the OPC T.A. Smith units for a majority of the time the units are operating, this standard does not meet the definition of achievable. Figure 5-1 presents a plot of the 3-hour rolling average NO_X emissions from all OPC T.A. Smith units, as measured by their CEMS, over an approximate 5-year period. An evaluation of the monitoring data, (summarized as periods with CCCT output greater than 73.6 MW, and including periods of startup and shutdown as currently evaluated for facility compliance

[147] The RBLC also included a modification at the PSO Comanche Power Station in Comanche, Oklahoma for a modification to meet a Best Available Retrofit Technology (BART) requirement. The resulting BART limit was 0.15 lb/MMBtu. As BART requirements are typically less stringent than BACT, this unit is not included for comparison.

reporting) indicates times where the NO_X levels are between 2.9 and 3.0 ppmvd at 15% O_2.[148] In fact, there are periods where emissions are above the 3.0 ppmvd at 15% O_2 limit on a 3-hour rolling average basis as shown in Figure 5-1.[149]

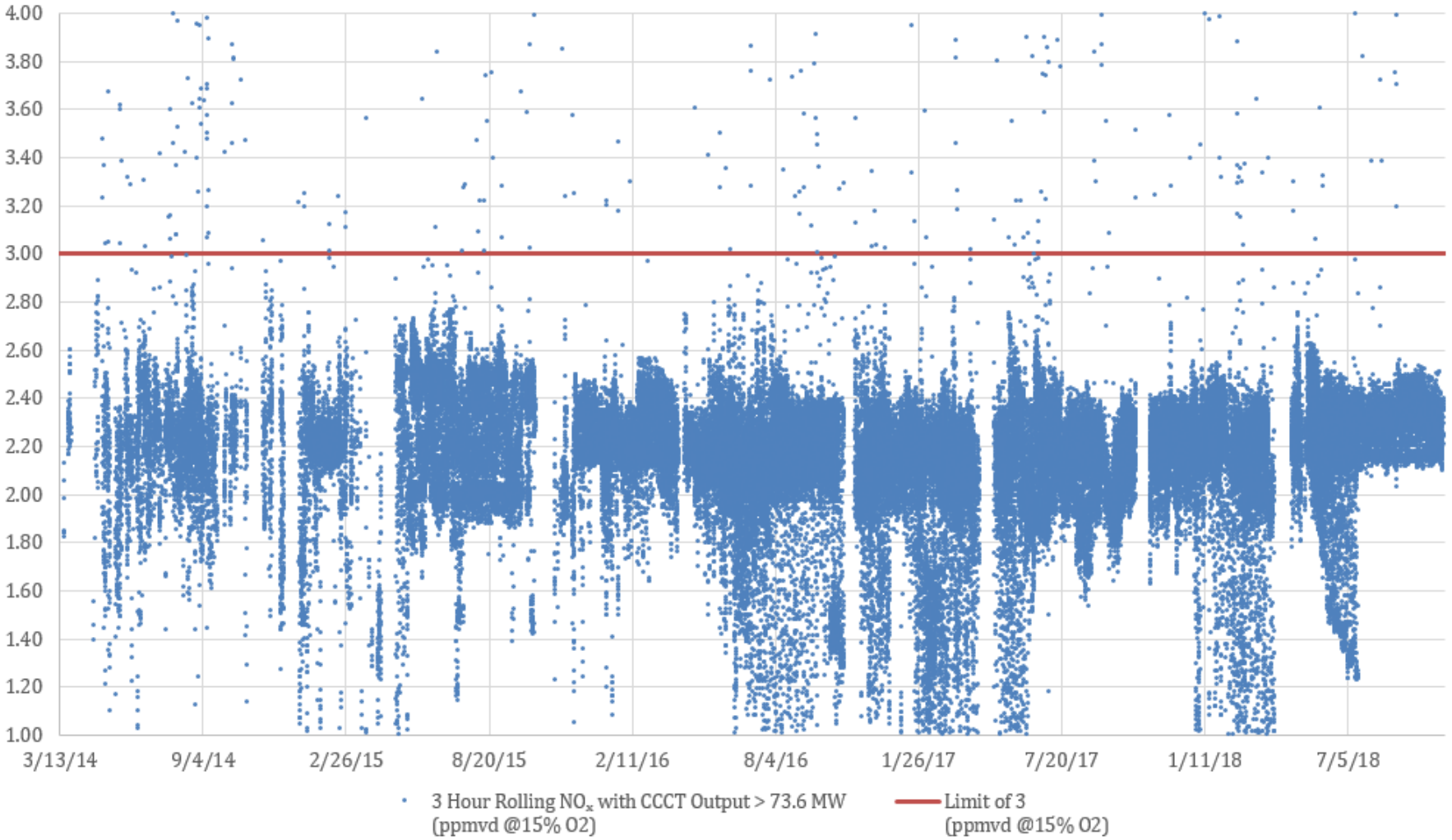
Figure 5-1 shows that there are presently some instances of exceedances of the current NO_X limit. While OPC strives to maintain compliance with the existing 3.0 ppm NO_X limitation (currently considered by OPC to include periods of startup and shutdown), there are still intermittent periods (usually following startup operations), where the combustion turbine and emissions control systems have not fully stabilized, leading to exceedances of the 3.0 ppm limit.[150] As OPC desires to maintain continuous compliance with all emission limits, any further reduction in the existing emission limit could potentially lead to an increase in the percentage of exceedances. Accordingly, OPC proposes that the BACT limit for NO_X remain at 3.0 ppmvd at 15% O_2 on a 3-hour rolling average basis, excluding periods of startup and shutdown. The existing and unchanged BACT limits for NO_X (lb/day, tpy) for the combined cycle combustion turbine units include periods of SUSD. OPC will continue to take all reasonable efforts to maintain as low an exceedance percentage as possible for the 3.0 ppmvd limit.

[148] Current facility compliance reporting conservatively considers the 3.0 ppm @ 15% O_2 NOx emission limit to be in effect at all times, including periods of startup and shutdown, as existing permit limits do not explicitly exclude the 3.0 ppm limit during periods of startup and shutdown.

[149] Permit No. 4911-213-0034-V-08-0 Condition 3.3.7 requires that no combustion turbine be operated below 73.6 MW except during periods of startup and shutdown or during periods of special testing as authorized.

[150] OPC reports all instances of excess emissions to EPD as part of the facility's semiannual monitoring report, as required under Permit Conditions 6.1.4 and 6.1.7.

Figure 5-1. 3-Hour Rolling Average NO_X Data (CCCT Output > 73.6 MW)



Please note that the data points shown in Figure 5-1 include data collected during periods of startup, shutdown, and malfunction periods.

The proposed 3.0 ppmvd BACT limit is proposed, in the future, to not apply during periods of startup/shutdown. Secondary BACT limits are required given 1) that the non-steady state operations during periods of startup and shutdown result in a substantially different NO_X emissions profile as the combustion units are not operating in an ideal mode for managing combustion characteristics; and 2) the SCR system is not effective during such periods before meeting its operating temperature, impacting the ability to meet the 3.0 ppmvd emission limitation. OPC T.A. Smith also proposes that the existing secondary mass rate BACT limitations, that include periods of startup and shutdown, be retained, despite the proposed energy generation increases. The secondary BACT limitations presently include:

- Permit Condition 3.3.5.a restricts combined NO_X emissions to 279 tpy during any consecutive 12-month period from CT1/DB1 and CT2/DB2 (i.e., CCCT1 and CCCT2, which make up Block 1);
- Permit Condition 3.3.5.b restricts combined NO_X emissions to 279 tpy during any consecutive 12-month period from CT3/DB3 and CT4/DB4 (i.e., CCCT3 and CCCT4, which make up Block 2); and
- Permit Condition 3.3.6 restricts each CCCT system to NO_X emissions of up to 1,153 pounds per day (24-hour period between 12:00 midnight and the following midnight).

5.8. TURBINE SYSTEMS GHG ASSESSMENT

This section contains a high-level review of pollutant formation and possible control technologies for the combustion turbine systems. Though the primary GHG emissions from natural gas combustion in the combustion turbine systems are CO_2, GHG BACT is discussed separately for CH_4 and N_2O.

CO_2 production from combustion occurs in theory by a reaction between carbon in any fuel and oxygen in the air and proceeds stoichiometrically (for every 12 pounds of carbon burned, 44 pounds of CO_2 is emitted).[151] The primary component of natural gas, CH_4, can be emitted when natural gas is not burned completely.[152] The last primary component for calculating greenhouse gas emissions (in addition to CO_2 and CH_4) is N_2O. N_2O formation is limited during complete gas combustion situations, as most oxides of nitrogen will tend to oxidize completely to NO_2, which is not a GHG.[153]

Please note that the GHG BACT assessment presents a unique challenge with respect to the evaluation of BACT for CO_2 and CH_4 emissions. The technologies that are most frequently used to control emissions of CH_4 in hydrocarbon-rich streams (e.g., flares and thermal oxidizers) actually convert CH_4 emissions to CO_2 emissions. Consequently, the reduction of one GHG (i.e., CH_4) results in a simultaneous increase in emissions of another GHG (i.e., CO_2).

5.8.1. Turbine Systems CO_2 BACT

The following section presents BACT evaluations for CO_2 emissions from the modified turbine systems.

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[151] *NC Greenhouse Gas (GHG) Inventory Instructions for Voluntary Reporting, November 2009*. Prepared by the North Carolina Division of Air Quality. https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/inventory/forms/GHG_Emission_Inventory_Instructions_Nov2009_Voluntary.pdf

[152] AP-42, Chapter 1, Section 4, *Natural Gas Combustion*. July 1998.

[153] *NC Greenhouse Gas (GHG) Inventory Instructions for Voluntary Reporting, November 2009*. Prepared by the North Carolina Division of Air Quality. https://ncdenr.s3.amazonaws.com/s3fs-public/Air%20Quality/inventory/forms/GHG_Emission_Inventory_Instructions_Nov2009_Voluntary.pdf

5.8.1.1. Identification of Potential CO_2 Control Technologies (Step 1)

OPC searched for potentially applicable emission control technologies for CO_2 from combustion turbines by researching the U.S. EPA control technology database, guidance from U.S. EPA and other sources as described in Section 5.4.1 of this report, technical literature, control equipment vendor information, state permitting authority files, and by using process knowledge and engineering experience. The RBLC lists technologies and corresponding emission limits that have been approved by regulatory agencies in permit actions. These results are summarized in Appendix C, detailing emission levels proposed for similar types of emissions units. Based on the RBLC search, no add-on control methods for GHGs were described for any of the facilities. Many facilities listed a variant of good combustion practices, efficient operation, state-of-the-art technology (for greenfield sites), or low emitting fuels (e.g., pipeline-quality natural gas). Although not mentioned in the RBLC for any sites, energy storage technologies such as batteries are deemed to fall outside the scope of this analysis since they would essentially redefine the source.

OPC used a combination of published resources and general knowledge of industry practices to generate a list of potential controls for CO_2 emitted from combustion turbine systems. OPC excluded options such as battery storage or solar power generation from the GHG control technology assessment as they would redefine the business purpose of the proposed projects: OPC T.A. Smith typically operating as a high capacity factor natural gas-fired electric generating facility utilizing combined-cycle combustion turbines, maximizing utilization of the existing assets in a relatively steady-state mode of operation, with normal anticipated variations based on supply needs. U.S. EPA has affirmed that evaluation of control options or lower-emitting GHG processes, such as solar power, that would fundamentally redefine the source is not a requirement of the BACT review in their response to comments on the proposed Palmdale Hybrid Power Project, subsequently upheld in an order denying review of the PSD permit.[154]

The following potential CO_2 control strategies were considered as part of this BACT analysis:

- Carbon Capture and Storage (CCS); and
- Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices.

These control technologies are briefly discussed in the following sections. Other CO_2 control technologies such as use of alternative fuels (with lower GHG emissions) were not considered because they were not within the scope of the projects. OPC has already identified that pipeline-quality natural gas is the sole fuel combusted in the turbine systems.

5.8.1.1.1 Carbon Capture and Storage

CCS, also known as CO_2 sequestration, involves cooling, separation and capture of CO_2 emissions from the flue gas prior to being emitted from the stack, compression of the captured CO_2, transportation of the compressed CO_2 via pipeline, and finally injection and long-term geologic storage of the captured CO_2. For CCS to be

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[154] U.S. EPA Environmental Appeals Board decision, *In re: City of Palmdale (Palmdale Hybrid Power Project)*. PSD Appeal No. 11-07, p. 727, decided September 17, 2012, citing .S. EPA Region 9, *Responses to Public Comments on the Proposed Prevention of Significant Deterioration Permit for the Palmdale Hybrid Power Project* at 3 (Oct. 2011).

"Finally, we [EPA] note that the incorporation of the solar power generation into the BACT analysis for this facility [Palmdale] does not imply that other sources must necessarily consider alternative scenarios involving renewable energy generation in their BACT analyses. In this particular case, the solar component was a part of the applicant's Project as proposed in its PSD permit application. Therefore, requiring the applicant to utilize, and thus construct, the solar component as a requirement of BACT did not fundamentally redefine the source. EPA has stated that an applicant need not consider control options that would fundamentally redefine the source. However, it is expected that each applicant consider all possible methods to reduce GHG emissions from the source that are within the scope of the proposed project."

technically feasible, all three components needed for CCS must be technically feasible; carbon capture and compression, transport, and storage.

The first phase in CCS is to separate and capture the CO_2 gas from the exhaust stream, and then to compress the CO_2 to a supercritical condition.[155] Since most storage locations for CO_2 are greater than 800 meters deep, where the natural temperatures and pressures are greater than the critical point for CO_2, to inject CO_2 to those depths requires pressurizing the captured CO_2 to a supercritical state.

CO_2 capture can be performed via solvents or sorbents. The choice of the precise process varies with the properties of the exhaust stream. CO_2 separation has been well demonstrated in the oil and gas industries, but the characteristics of those streams are very different from a turbine system exhaust. Existing CO_2 capture technologies have not been demonstrated in the context of capturing CO_2 from large utility-scale natural gas-fired combined-cycle power plants.[156] Most combustion tests and projects have been on exhaust streams from coal combustion, which has more highly concentrated CO_2 than exhaust from natural gas combustion.

Once separated, CO_2 must be compressed to supercritical conditions for transport and storage. There are no technical challenges with compressing CO_2 to those levels, but specialized technologies with high operating energy requirements are necessary. For natural gas combined-cycle power plants, the estimated energy penalty is 15%.[157] The CO_2 could be compressed to supercritical either before or after transport.

For phase two, CO_2 would be transported to a repository. Transport options could include pipeline or truck. Specialized designs may be required for CO_2 pipelines, particularly if supercritical CO_2 is being transported. Transport of CO_2 by pipeline is a demonstrated technology, but currently most CO_2 pipelines are in rural areas. Obtaining right-of-way in developed areas is difficult.

Various CO_2 storage methods have been proposed, though only geologic storage is achievable currently. Geologic storage involves injecting CO_2 into deep subsurface formations for long-term storage. Typical storage locations would be deep saline aquifers as well as depleted or un-mineable coal seams. Captured CO_2 could also potentially be used for enhanced oil recovery via injection into oil fields.

5.8.1.1.2 Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices

As the baseline of most analyses, pollutant formation can be most cost-effectively minimized by efficient turbine operation and good combustion, operating, and maintenance practices. One of the most efficient ways to generate electricity from a natural gas fuel source is the use of a combined cycle design.[158] OPC T.A. Smith is already a combined cycle plant that solely fires pipeline-quality natural gas. The AGP Projects result in an approximate 1-2% increase in turbine system efficiency. Increased energy generation efficiency results in lower GHG emissions per MWh of electricity produced.

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[155] Supercritical means that the CO_2 has properties of both a liquid and a gas. Supercritical CO_2 is dense like a liquid but has a viscosity like a gas. For additional details see https://www.netl.doe.gov/coal/carbon-storage/faqs/carbon-storage-faqs

[156] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 61.

[157] *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, Section III, page A-14. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

[158] http://needtoknow.nas.edu/energy/energy-sources/fossil-fuels/natural-gas/

Within combustion units, operators can control the localized peak combustion temperature and combustion stoichiometry to achieve efficient fuel combustion. Outside of the unit, energy loss can be minimized by providing sufficient insulation to the combustion units and associated duct work.

For the purposes of this GHG control technology assessment, it is important to note that good operating practices includes periodic maintenance by abiding by an operations and maintenance (O&M) plan. Maintaining the combustion units to the designed combustion efficiency and operating parameters is important for energy efficiency related requirements and efficient operation.

5.8.1.2. Elimination of Technically Infeasible CO_2 Control Options – Turbine Systems (Step 2)

5.8.1.2.1 Carbon Capture and Storage

CCS involves cooling, separation and capture of CO_2 from the flue gas prior to the flue gas being emitted from the stack, compression of the captured CO_2, transportation of the compressed CO_2 via pipeline, and finally injection and long-term geologic storage of the captured CO_2. For CCS to be technically feasible, all three components (carbon capture and compression, transport, and storage) must be technically feasible.

Carbon Capture

Currently, only two options appear to be feasible for capture of CO_2 from the flue gas from the turbine systems: Post-Combustion Solvent Capture and Stripping and Post-Combustion Membranes. In one 2009 M.I.T. study conducted for the Clean Air Task Force, it was noted that "To date, all commercial post-combustion CO_2 capture plants use chemical absorption processes with monoethanolamine (MEA)-based solvents."[159]

While Post-Combustion Membranes have been demonstrated in small scale (7,500 hours at 0.05 MW) on a coal-fired power plant with the goal of a pilot scale test at 1 MW, this technology has also not been demonstrated for flue gas control in turbine operations.[160] Although absorption technologies are currently available that may be adaptable to flue gas streams of similar character to the flue gas from the turbine systems, to OPC's knowledge, the technology has never been commercially demonstrated for flue gas control in natural gas fired turbine operations.[161]

In the Interagency Task Force report on CCS technologies, a number of pre- and post-combustion CCS projects are discussed in detail; however, many of these projects are in formative stages of development and are predominantly power plant demonstration projects (and mainly slip stream projects).[162] Capture-only technologies are technically available, however not yet commercially demonstrated. In addition, prior to sending the CO_2 stream to the appropriate storage site, it is necessary to compress the CO_2 from near atmospheric pressure to pipeline pressure (around 2,000 psia). The compression of the CO_2 would require a large auxiliary

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[159] Herzog, Meldon, Hatton, Advanced Post-Combustion CO_2 Capture, April 2009, page 7. https://sequestration.mit.edu/pdf/Advanced_Post_Combustion_CO2_Capture.pdf

[160] *New Membrane Technology for Post-Combustion Carbon Capture Begins Pilot-Scale Test,* Office of Fossil Energy, U.S. Department of Energy, January 26, 2015. https://www.energy.gov/fe/articles/new-membrane-technology-post-combustion-carbon-capture-begins-pilot-scale-test

[161] Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to selection of BACT for emissions of NO_X, Attachment B page 62.

[162] *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, Section III, pages. 27-52. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

power load, resulting in additional fuel (and CO_2 emissions) to generate the same amount of power.[163] The auxiliary power load could be handled by installation of a separate system to solely support CO_2 compression, or alternatively be supported by reduced the available energy for sale, relying on the energy generating systems to instead meet the power needs of the compression system. This is often referred to as an "energy penalty" for operation of the CO_2 compression system.

Carbon Transport

The next step in CCS is the transport of the captured and compressed CO_2 to a suitable location for storage. This would typically be via pipeline. Pipeline transport is available and demonstrated, although costly, technology. Short CO_2 pipelines have been constructed from power plants to proposed injection wells. However, these pipelines are dedicated use for the power plants and are unavailable for other industrial sites.

Since there are no other CO_2 pipelines in the area, OPC would need to construct a CO_2 pipeline to a storage location if it were to pursue carbon sequestration as a CO_2 control option.[164] While it may be technically feasible to construct a CO_2 pipeline, considerations regarding the land use and availability need to be made. For the purposes of this analysis, it is conservatively assumed that a shortest distance pipeline can be built from a potential sequestration site to a potential carbon storage location. Realistically, a longer pipeline would be required to address land use and right-of-way considerations.

Carbon Storage

Capture of the CO_2 stream and transport are not sufficient control technologies by themselves, but require the additional step of permanent storage. After separation and transport, storage could involve sequestering the CO_2 through various means such as enhanced oil recovery, injection into saline aquifers, and sequestration in un-minable coal seams, each of which are discussed as follows:

- *Enhanced Oil Recovery (EOR)*: EOR involves injecting CO_2 into a depleted oil field underground, which increases the reservoir pressure, dissolves the CO_2 in the crude oil (thus reducing its viscosity) and enables the oil to flow more freely through the formation with the decreased viscosity and increased pressure. A portion of the injected CO_2 would flow to the surface with the oil and be captured, separated, and then re-injected. At the end of EOR, the CO_2 would be stored in the depleted oil field.
- *Saline Aquifers*: Deep saline aquifers have the potential to store post-capture CO_2 deep underground below impermeable cap rock.
- *Un-Mineable Coal Seams*: Additional storage is possible by injecting the CO_2 into un-mineable coal seams. This has been used successfully to recover coal bed methane. Recovering methane is enhanced by injecting CO_2 or nitrogen into the coal bed, which adsorbs onto the coal surface thereby releasing methane.

There are additional methods of sequestration such as direct ocean injection of CO_2 and algae capture and sequestration (and subsequent conversion to fuel); however, these methods are not as widely documented in the literature for industrial scale applications. As such, while capture-only technologies may be technologically available at a small-scale, the limiting factor is the availability of a mechanism for OPC to permanently store the captured CO_2.

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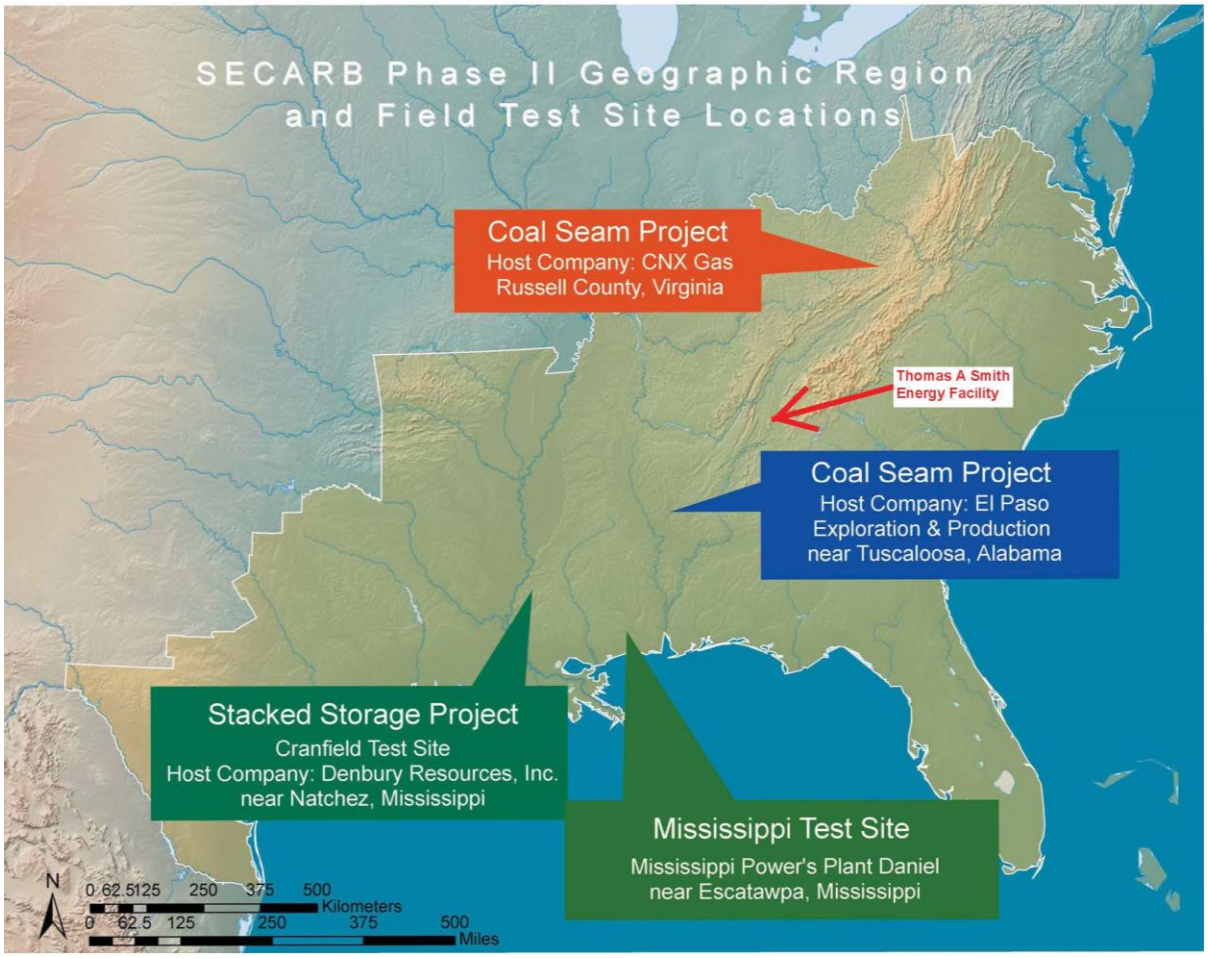
[163] *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, page 29. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

[164] *A Review of the CO_2 Pipeline Infrastructure in the U.S.*, National Energy Technology Laboratory, Office of Fossil Energy, U.S. Department of Energy, April 2015. DOE/NETL-2014/1681. https://www.energy.gov/sites/prod/files/2015/04/f22/QER%20Analysis%20-%20A%20Review%20of%20the%20CO2%20Pipeline%20Infrastructure%20in%20the%20U.S_0.pdf

The National Energy Technology Laboratory's (NETL) Carbon Capture and Storage Database provides a summary of potential storage locations.[165] According to the database, the Black Warrior Basin of Alabama is the closest sequestration site where a test well has been drilled. The Black Warrior Basin, located Northeast of Tuscaloosa, Alabama is a pilot-scale Southeast Regional Carbon Sequestration Partnership (SECARB) CO_2 sequestration project site that has achieved an injection of 278 tons of CO_2 with the potential to sequester 1.12 to 2.32 Gigatonnes (Gt) of CO_2.[166] The injection location is a mature coalbed methane reservoir within the Blue Creek Coal Degasification Field in Tuscaloosa County, Alabama. Figure 5-2 is a map of possible sequestration formations that have gone through SECARB's Phase II Validation program.[167] The Black Warrior Basin, listed as the Coal Seam Project near Tuscaloosa, AL on Figure 5-2, is the closest pilot or large-scale CO_2 sequestration project site to OPC T.A. Smith and is approximately 173 miles from the Facility.

Figure 5-2. Map of Potential Carbon Sequestration Sites



OPC has concluded that CCS technology is not technically feasible at this time, based on the discussions provided. However, despite the significant technical challenges discussed earlier in implementing CCS

[165] Carbon Capture and Storage Database maintained by the NETL, accessed February 2019 at https://www.netl.doe.gov/coal/carbon-storage/worldwide-ccs-database

[166] *Black Warrior Basin Coal Seam Project,* SECARB. Summary document at http://www.secarbon.org/files/black-warrior-basin.pdf

[167] http://www.secarbon.org/index.php?page_id=8

technology on turbine systems of this size, OPC is including CCS in Step 3 of this analysis, although realistically technical feasibility is still unlikely.

5.8.1.2.2 Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices

Efficient turbine operation coupled with good combustion, operating, and maintenance practices are a potential control option for optimizing the fuel efficiency of the combustion turbines. Natural gas-fired combustion turbines typically operate in a lean pre-mix mode to ensure an effective staging of air/fuel ratios in the turbine to maximize fuel efficiency and minimize incomplete combustion. Furthermore, the turbine systems are sufficiently automated to ensure optimal fuel combustion and efficient operation leaving virtually no need for operator tuning of these aspects of operation.

Therefore, CCS and efficient turbine operation coupled with good combustion, operating, and maintenance practices are evaluated further for CO_2 BACT purposes.

5.8.1.3. Summary and Ranking of Remaining CO_2 Controls (Step 3)

The remaining control methods are listed below, in descending order of the expected CO_2 reductions.

- Carbon capture and storage (CCS), 90% reduction[168]
- Efficient Turbine Operation and Good Combustion, Operating, and Maintenance Practices, reduction efficiency is not applicable.

5.8.1.4. Evaluation of Most Stringent CO_2 Control Technologies (Step 4)

5.8.1.4.1 Carbon Capture and Storage

As the most stringent control option available, CCS would be considered BACT, barring the consideration of its energy, environmental, and/or economic impacts. However, for the reasons outlined in this section, this option should not be relied upon as BACT and the next most stringent alternative should be evaluated.

The flue gas stream from natural gas fired turbine stacks will be significantly lower in CO_2 concentration than coal fired plant exhaust streams that have demonstrated capture of CO_2 for sequestration. Natural gas fired plants have an average concentration of 3-4% CO_2 in the flue gas compared to 13-15% for coal fired plants.[169] As such, additional processing of the exhaust gas would be required to implement CCS for the proposed projects. These steps include separation (removal of other pollutants from the waste gases), capture, and compression of CO_2, transfer of the CO_2 stream and sequestration of the CO_2 stream. These processes require additional equipment to reduce the exhaust temperature, compress the gas, and transport the gas via pipelines. Such equipment would require additional electricity and generate additional air emissions, of both criteria pollutants and GHG pollutants. This would result in negative environmental and energy impacts.

As previously discussed, a significant energy penalty is realized to achieve the capture and compression of CO_2 from the exhaust stream. Once separated, CO_2 must be compressed to supercritical conditions for transport and storage. There are no technical challenges with compressing CO_2 to those levels, but specialized technologies with high operating energy requirements are necessary. For natural gas combined-cycle power plants, the

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[168] *Estimating Carbon Dioxide Transport and Storage Costs*, National Energy Technology laboratory, U.S. DOE, DOE/NETL-2010/1447, Page 9, March 2010.

[169] *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, page 29. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

estimated energy penalty is 15%.[170] The magnitude of the energy penalty associated with implementation of CCS is a critical consideration in the context of the AGP Projects. AGP Project III is anticipated to increase the capacity of each block by approximately 28.6 MW in the summer and 31.0 MW in the winter (Block 1 being CCCT1 and CCCT2 and steam turbine, and Block 2 being CCCT3 and CCCT4 and steam turbine). Developed cost models for various power plants have estimated that the energy costs associated with the capture requirements of CCS for a natural gas combustion turbine system are 0.354 kWh/kg of CO_2 processed.[171] Table 5-12 presents an analysis of the impact on energy production if CCS was required as a result of the proposed projects.

Table 5-12. CCS Energy Penalty Analysis

Parameters	Value
Annual CO_2 Captured (tpy)[1]	4,567,680
CO_2 Captured (kg/yr)[2]	4,143,734,521
Proposed Project Increase in Power Output (kW)[3]	62,000
Proposed Project Increase in Power Output (MW)[3]	62
Proposed Project Increase in Energy Produced (kWh/yr)[4]	543,120,000
Proposed Project Increase in Energy Produced (MWh/yr)	543,120
Energy Used for Capture (kWh/kg CO_2 processed)[5]	0.354
Energy Used for Capture (kWh/yr)[6]	1,466,882,020
Energy Used for Capture (MWh/yr)	1,466,882
Energy Increase with Proposed Project if CCS Included (MWh/yr)	*-923,762*
Power Output Before Project (MW)	1,240
Power Output After Project (without CCS)(MW)	1,302
Power Used for Capture if CCS included (MW)[7]	167
Estimated Energy Penalty (%)	12.86%

1. Presumes 90% capture of the CO_2 emissions based on the sustainable annual capacity of the facility.
2. CO_2 Captured (kg/yr) = CO_2 Captured (tpy) * 2,000 (lb/ton) / 2.20462 (lb/kg)
3. Proposed Project Increase in Power Outpur conservatively based on the maximum anticipated winter condition increase of 31 MW per block, with two blocks operating at OPC Smith. kW = MW * 1,000 kW/MW
4. Proposed Project Increase in Energy Produced (kWh) = Proposed Project Increase in Power Output (kW) * 8,760 (hr/yr)
5. David, Jeremy and Howard Herzog, The Cost of Carbon Capture, published 2000, p. 2, accessed at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.9269&rep=rep1&type=pdf
6. Energy Used for Capture (kWh/yr) = Energy Used for Capture (kWh/kg CO_2 processed) * CO_2 Captured (kg/yr)
7. Power Used for Capture (MW) = Energy Used for Capture (MWh/yr) / 8,760 (hr/yr)

In the context of the proposed projects, the theoretical energy penalty if CCS is employed would result in a negative impact on energy generation for the proposed projects, reducing energy available for sale by an estimated 900,000 MWh/yr (presuming maximum sustainable production is maintained), an estimated 12.86%

[170] *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, Section III, p. A-14. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

[171] David, Jeremy and Howard Herzog, *The Cost of Carbon Capture*, published 2000, p. 2, accessed at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.9269&rep=rep1&type=pdf

energy penalty. Therefore, OPC would have no incentive to pursue the proposed projects, which results in an increase in energy generation efficiency for the existing combustion turbine systems, if OPC were required to utilize CCS for GHG emission reductions.

A detailed cost analysis related to the installation of CCS has not been provided in light of the substantial negative energy penalty associated with CCS. Realistically, OPC would also not be able to secure financing necessary for the capital intensive costs associated with CCS systems, in light of the fact that OPC could not demonstrate a financial benefit (i.e., increased electricity for sale) if CCS were required.[172,173] Current estimates indicate that the capital cost alone for a CCS system for the OPC T.A. Smith facility could cost in excess of $500 million dollars.

Given the negative energy and economic considerations, as well as the technical challenges associated with implementing CCS, it is deemed infeasible and eliminated as a viable option for BACT.

5.8.1.5. Selection of CO_2 BACT (Step 5)

CO_2 BACT for these projects includes efficient turbine operation coupled with good combustion, operating, and maintenance practices. As mentioned previously, the resulting BACT standard is an emission limit unless technological or economical limitations of the measurement methodology would make the imposition of an emissions standard infeasible, in which case a work practice or operating standard can be imposed.

BACT determinations for similar combined-cycle generating units, as detailed in the RBLC summary tables in Appendix C denote energy efficiency, good design and good combustion practices as BACT. Post-combustion capture and sequestration of CO_2 is not required. BACT limits for natural gas combined-cycle units can be found expressed in terms of lb/MWh, Btu/kWh, or tons, typically with a 12-month rolling total averaging period.

Focusing on modified units given anticipated similarities in performance and possible combustion efficiencies, Table 5-13 summarizes the applicable GHG BACT limit, presenting an equivalent limit for the OPC T.A. Smith units in terms of tons per year. In addition, the CO_2 emission limit per NSPS Subpart TTTT for constructed or reconstructed combined-cycle combustion turbines is also presented for comparison, although the OPC T.A. Smith units are not subject to the emission limitations per NSPS Subpart TTTT.

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[172] CCS has high capital and operating costs. Capital costs for natural gas combined cycle plants with CCS have increased capital costs of $340 million dollars (2010 dollars) relative to plants without CCS, per the *Report of the Interagency Task Force on Carbon Capture and Storage*, August 2010, Section III, page A-14. https://www.energy.gov/sites/prod/files/2013/04/f0/CCSTaskForceReport2010_0.pdf

[173] Detailed discussion of capital and operating costs associated with CCS, including the influence of the magnitude of the capital costs for CCS relative to the total capital costs for proposed construction of the new electric generating facility. Application No. 17040013, *Project Summary for a Construction Permit Application from Jackson Generation, LLC, for an Electrical Generating Facility in Elwood, Illinois*, issued by the Illinois EPA for the public comment period beginning on September 21, 2018. Discussion related to *Step 4: Evaluate the Most Effective Controls* for GHG, Attachment B pages 65 - 70.

Table 5-13. CO_2 Limit Review

Site	Limit for Turbine with Duct Burner	Units	Equivalent OPC Smith Unit Limit (tpy)[1]
CO_2 Limits			
NSPS Subpart TTTT	1,000	lb/MWhr gross output	1,425,690
CPV 2018	878	lb/MWhr gross output	1,251,756
CO_2e Limits			
Midland	1,071	lb/MWhr gross output	1,526,914
Modified Units with no output based limit for CT w/ DB			
Hanging Rock	Permit action did not trigger PSD, therefore GHG BACT not required.		
CPV 2014	Permit action included tpy GHG BACT or CT only BACT value.		
New Covert	Permit action included tpy GHG BACT		

1. Maximum Output for OPC-Smith facility post-project

Facility Total	1,302 MW
Output from each CCCT system	325.5 MW

Table 5-14 summarizes OPC T.A. Smith's GHG emission quantification for post-project operations, detailing the maximum annual emissions based on the anticipated operating capacity for sustainable operation.

Table 5-14. OPC T.A. Smith GHG Emission Quantification

GHG	Emission Factor[1, 2] (lb/MMBtu)	Maximum Annual Operating Capacity[3] (Million MMBtu/yr)	Maximum Annual Emissions[4] (tpy)
CO_2	118.86	85.4	5,075,200
CH_4	2.20E-03	85.4	94.1
N_2O	2.20E-04	85.4	9.41
Total GHG emissions (CO_{2e})[5]			**5,080,359**
Each Unit (i.e., one gas turbine and one HRSG with duct burner)			**1,270,090**

1. CO_2 Emission factor derived per Appendix G to 40 CFR Part 75, Section 2.3. CO_2 (lb/MMBtu) = 1,040 scf/MMBtu * 44.0 lb/lb-mole / 385 scf CO_2/lb-mole
2. CH_4 and N_2O emissions factors per Part 98, Subpart C, Table C-2. kg/MMBtu factors converted to lb/MMBtu multiplying by 2.20462 lb/kg
3. Maximum Annual Operating Capacity anticipated for sustainable operation.
4. Emissions (tpy) = EF (lb/MMBtu) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton
5. Total GHG emissions in CO2e is the sum of the product of each GHG and its respective global warming potential (GWP) per 40 CFR Part 98 Subpart A, Table A-1, effective January 1, 2014.

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

The potential CO_2e annual emissions for each combined-cycle combustion turbine with HRSG and duct burner are estimated to be 1,269,978 tpy post-project.[174] Note that estimated CO_2 emissions comprise 99.9% of the CO_2e emissions. Based on a comparison to other modified units, OPC T.A. Smith's annual CO_2e emissions represents an achievable BACT performance level to ensure on-going compliance. While the CPV 2018 limit for CO_2 denoted in Table 5-13 is slightly lower, it is important to remember that the CPV 2018 modification proposed changes to the DLN combustors (complete replacement) which reduces the similarity to the proposed OPC T.A. Smith AGP modifications. OPC's proposed CO_2e 12-month rolling total emissions is less than the equivalent annual emissions predicted if the NSPS Subpart TTTT limit of 1,000 lb/MWh gross output were relied upon for derivation of annual emissions based on the potential OPC T.A. Smith gross output capacity post-project (i.e., 1,302 MW site-wide or 325 MW per CCCT system).

Therefore, OPC proposes a total CO_2e BACT emission limit of 1,270,090 tons per year for each turbine and associated duct burner systems. The proposed emission limits are based on 12-month rolling total basis and includes CO_2, CH_4, and N_2O emissions, with CO_2 emissions representing 99.9% of the total GHG emissions.

Compliance with the proposed BACT limit will be demonstrated by monitoring fuel consumption and performing calculations consistent with those presented in Table 5-14. Specifically, the monthly CO_2e emissions will be calculated based on the monthly fuel use, the CO_2 emission factor from Appendix G to 40 CFR 75, the CH_4 and N_2O emission factors from Subpart C to 40 CFR 98, and the current GWPs from Subpart A to 40 CFR 98 (1 for CO_2, 25 for CH_4, and 298 for N_2O). These calculations will be performed on a monthly basis to ensure that the 12-month rolling total tons per year emission rate does not exceed this limit.

Through this proposed BACT limit, OPC limits the maximum fuel consumption and CO_2e emissions, effectively requiring efficient operation at the design heat rate, when operating at 100% load (as inefficient turbine operation would require additional fuel consumption which is undesirable from an operator's perspective).

5.8.2. Turbine Systems CH_4 BACT

CH_4 emissions from the natural gas-fired combustion turbines form as a result of incomplete combustion of hydrocarbons present in the natural gas fuel.

5.8.2.1. Identification of Potential CH_4 Control Technologies (Step 1)

The only available control options for minimizing CH_4 emissions from the combustion turbine systems are efficient turbine operation coupled with good combustion, operating, and maintenance practices to minimize unburned fuel. Oxidation catalysts are not considered available for reducing CH_4 emissions because oxidizing the very low concentrations of CH_4 present in the combustion turbine's exhaust would require much higher temperatures, residence times, and catalyst loadings than those offered commercially for CO oxidation catalysts. For these reasons, catalyst providers do not offer products for reducing CH_4 emissions from gas-fired combustion turbines.

5.8.2.2. Technically Infeasible CH_4 Control Options (Step 2)

Efficient turbine operation coupled with good combustion, operating, and maintenance practices are the only technically feasible control options for reducing CH_4 emissions from the combustion turbines.

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[174] CO_2 mass calculations based on methodologies per the Acid Rain Program, 40 CFR 75 Appendix G. Mass emissions for CH_4 and N_2O are based on emission factors per the GHG Mandatory Reporting Rule, 40 CFR 98 Subpart C, Table C-2. Conversion to CO_2e is based on the global warming potentials (GWP) per 40 CFR 98 Subpart A, Table A-1.

5.8.2.3. Summary and Ranking of Remaining CH_4 Control Technologies (Step 3)

Since efficient turbine operation coupled with good combustion, operating, and maintenance practices are evaluated in the remaining steps of the BACT analysis, no ranking of control options is required.

5.8.2.4. Evaluation of Most Stringent CH_4 Control Technologies (Step 4)

No adverse energy, environment, or economic impacts are associated with efficient turbine operation and good combustion, operating, and maintenance practices for reducing CH_4 emissions from the combustion turbine.

5.8.2.5. Selection of CH_4 BACT (Step 5)

Efficient turbine design and good combustion, operating, and maintenance practices are the selected control options for minimizing CH_4 emissions from the combustion turbine systems. OPC has determined that a numerical limit for CH_4 is unnecessary and that the work practices required for CO_2 BACT (i.e., monthly fuel consumption monitoring and emissions calculations), and efficient turbine operation coupled with good combustion, operating, and maintenance practices, are sufficient for CH_4 BACT, in addition to the aforementioned CO_2e limit as proposed in Section 5.8.1.5. The CH_4 portion of the proposed CO_2e BACT limit will be calculated based on the emission factor from 40 CFR Part 98 Subpart C and the GWP of 25 (per 40 CFR 98 Subpart A, rule effective January 1, 2014).

5.8.3. Turbine Systems N_2O BACT

For the proposed projects, the contribution of N_2O to the total CO_2e emissions is trivial and therefore should not warrant a detailed BACT review. Nevertheless, the additional information provided supports the rationale that the proposed projects meet BACT for contributions of N_2O to CO_2e.

A tradeoff between NO_X and N_2O emissions from the combustion turbines exists when developing a combustion control strategy which influences the BACT selection process. There are five (5) primary pathways of NO_X production in gas-fired combustion turbine combustion processes: thermal NO_X, prompt NO_X, NO_X from N_2O intermediate reactions, fuel NO_X, and NO_X formed through reburning. For turbines using DLN combustors, the N_2O pathway is an important mechanism of NO_X formation. Flame radicals produced in the high temperature and pressure DLN combustion zone react with the N_2O molecule, creating N_2 and NO.[175] In premixed gas flames, N_2O is primarily formed in the flame front or oxidation zone. Once formed, the N_2O is readily destroyed due to the relatively high concentration of H radicals, and therefore, the N_2O emissions from premixed gas flames like DLN combustor flames are found experimentally to be very small (generally less than 1 ppm). However, any mechanisms which decrease the H atom concentration in the N_2O formation zone can increase N_2O emissions. These mechanisms include lowering the flame combustion temperature, air-to-fuel staging, and injection of ammonia, urea, or other amine or cyanide species into the exhaust stream which are all common NO_X control measures.[176] Therefore, there is a tradeoff between NO_X and N_2O emissions when developing a combustion control strategy which influences the BACT selection process.

[175] Angello, L., Electric Power Research Institute, Fuel Composition Impacts on Combustion Turbine Operability, March 2006.
[176] American Petroleum Institute, Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry, February 2004.

5.8.3.1. Identification of Potential N_2O Control Technologies (Step 1)

N_2O catalysts are a potential control option, as these have been used in nitric/adipic acid plant applications to minimize N_2O emissions.[177] Through this technology, tail gas from the nitric acid production process is routed to a reactor vessel with a N_2O catalyst followed by ammonia injection and a NO_X catalyst.

5.8.3.2. Technically Infeasible N_2O Control Options (Step 2)

N_2O catalyst providers do not offer products to control N_2O emissions from gas-fired combustion turbines due to the very low N_2O concentrations present in exhaust streams (approximately 5 ppm).[178] In comparison, the application of a catalyst in the nitric acid industry sector has been effective due to the high (1,000-2,000 ppm) N_2O concentration in the exhaust stream.

With N_2O catalysts eliminated, good combustion practice is the only available control option.

Good combustion practices are technically feasible control options for reducing N_2O emissions from the combustion turbines.

5.8.3.3. Summary and Ranking of Remaining N_2O Control Technologies (Step 3)

Since good combustion practices are evaluated in the remaining steps of the BACT analysis, no ranking of control options is required.

5.8.3.4. Evaluation of Most Stringent N_2O Control Technologies (Step 4)

As indicated in U.S. EPA's guidance on GHG BACT, GHG control strategies may have the potential to produce higher criteria pollutants as in the case of the competing NO_X and N_2O combustion control strategies for OPC's combustion turbine systems. In such cases, the guidance suggests that the applicant should consider the effects of increases in emissions of other regulated pollutants that may result from the use of that GHG control strategy, and based on this analysis, the permitting authority can determine whether or not the application of that GHG control strategy is appropriate given the potential increases in other pollutants.[179]

Given the low N_2O emissions relative to NO_X emissions from the combustion turbine systems and U.S. EPA's continued concern over adverse impacts from ozone formation due to NO_X and VOC emissions, OPC does not consider it appropriate to control the combustion processes of the combustion turbine to specifically reduce N_2O emissions due to the counteractive increase in NO_X emissions. Therefore, good combustion practice for the specific purpose of minimizing N_2O formation is eliminated on the basis of adverse criteria pollutant impacts.

5.8.3.5. Selection of N_2O BACT (Step 5)

Efficient turbine design and general good combustion, operating, and maintenance practices are the selected control options for reducing N_2O emissions from the combustion turbines. OPC has determined that a numerical limit for N_2O emissions is unnecessary and that the work practices required for CO_2 BACT (i.e., monthly fuel consumption monitoring and emissions calculations), and efficient turbine operation coupled with good combustion, operating, and maintenance practices, are sufficient for N_2O BACT, in addition to the

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[177] *N_20 Emissions from Adipic Acid and Nitric Acid Production*, written by Heike Mainhardt (ICF Incorporated) and reviewed by Dina Kruger (U.S. EPA). http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/3_2_Adipic_Acid_Nitric_Acid_Production.pdf

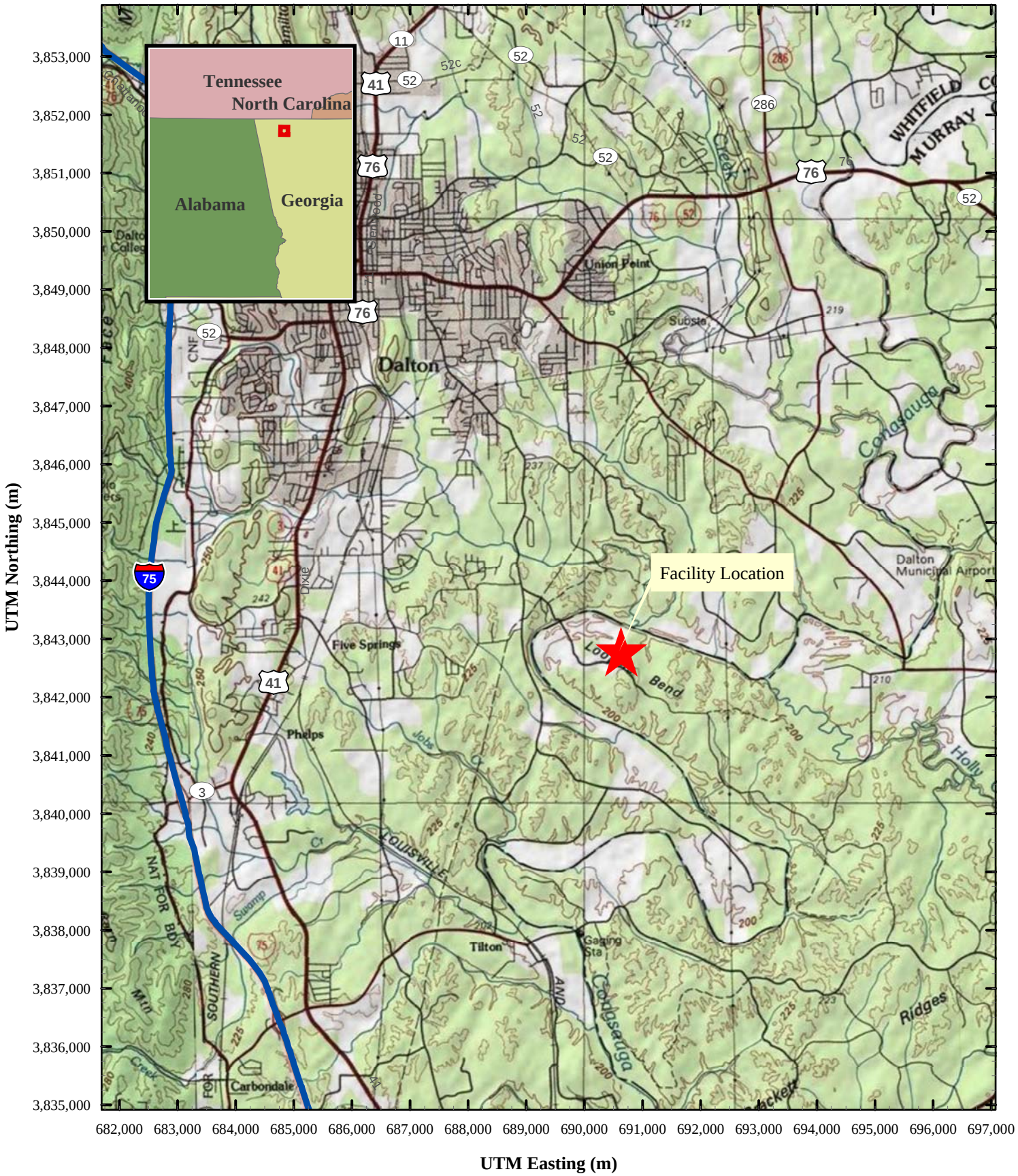
[178] *Emissions of Nitrous Oxide from Combustion Sources,* in Progress and Energy and Combustion Science 18(6): pages 529-552 , December 1992, found at: https://www.researchgate.net/publication/223546823_Emissions_of_nitrous_oxide_from_combustion_sources

[179] *PSD and Title V permitting Guidance for Greenhouse Gases*. March 2011, page 39.

aforementioned CO_2e limit as proposed in Section 5.8.1.5. The N_2O portion of the proposed CO_2e BACT limit will be calculated based on the emission factor from 40 CFR Part 98 Subpart C and the GWP of 298 (per 40 CFR 98 Subpart A, rule effective January 1, 2014).

APPENDIX A: AREA MAP AND PROCESS FLOW DIAGRAM

Figure A-1. Facility Area Map
Thomas A. Smith Energy Facility - Dalton, Georgia



Coordinates reflect UTM projection Zone 16, NAD83.

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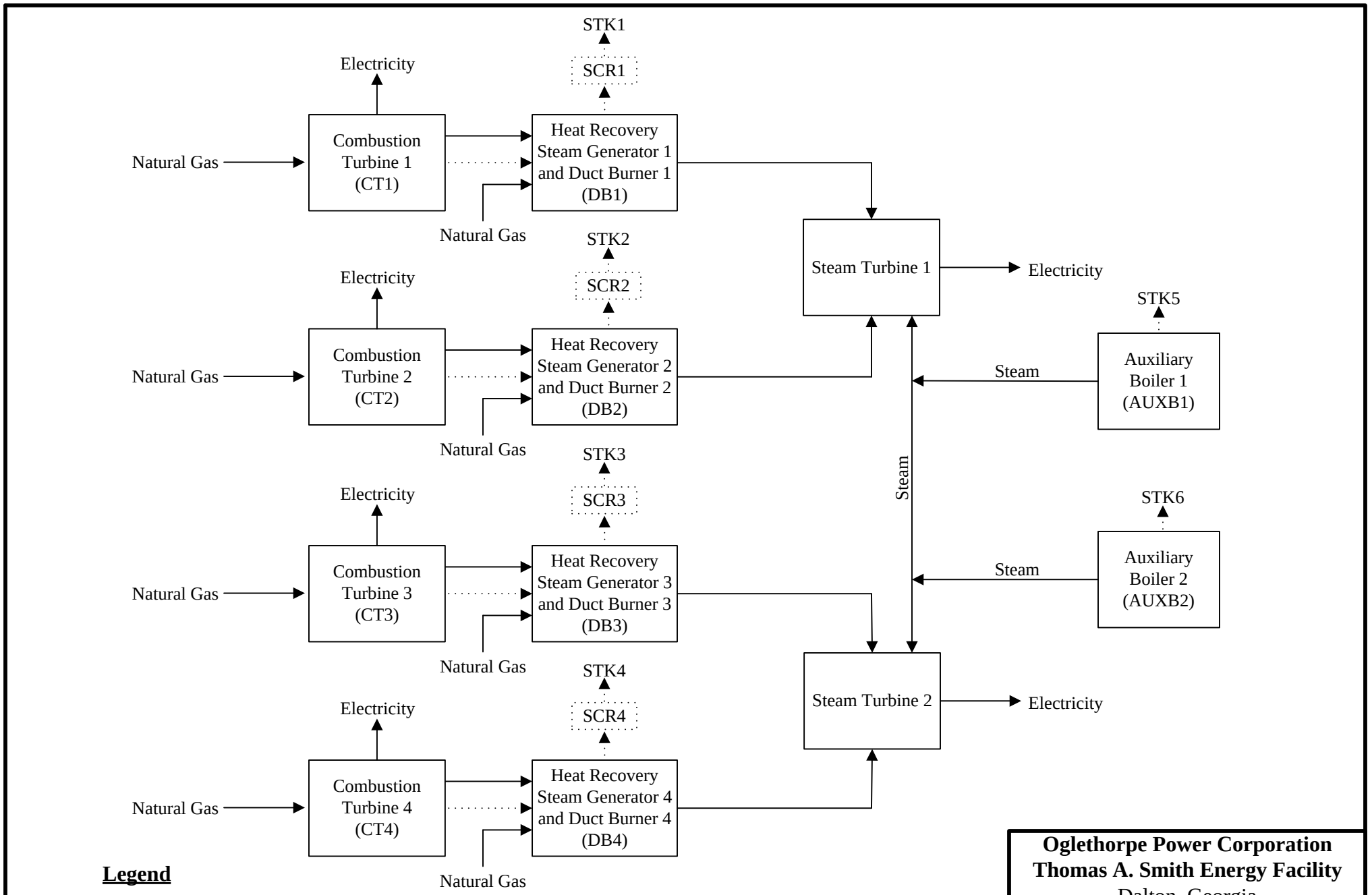

Oglethorpe Power Corporation
Thomas A. Smith Energy Facility
Dalton, Georgia

Figure A-2. Process Flow Diagram

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APPENDIX B: EMISSION CALCULATIONS

Table B-1. Natural Gas Burning Equipment - Operating Parameters - Design Capacity

Emission Source	Source No.	Fuel Type	Maximum Annual Operating Capacity (Million MMBtu/yr)	Annual Operation (hr/yr)
CCCT1	CT1 and DB1	Natural Gas	21.35	8,760
CCCT2	CT2 and DB2	Natural Gas	21.35	8,760
CCCT3	CT3 and DB3	Natural Gas	21.35	8,760
CCCT4	CT4 and DB4	Natural Gas	21.35	8,760
Auxiliary Boiler 1	AUXB1	Natural Gas	0.19	6,000
Auxiliary Boiler 2	AUXB2	Natural Gas	0.19	6,000

Table B-2. CCCT Potential Criteria Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)	Potential Emissions[8] (tpy)[9]
NO_X[1]	1.40E-02	558
CO[2]	2.95E-02	1,260
VOC[3]	4.40E-03	188
PM[4]	8.00E-03	342
Total PM_{10}[4]	8.00E-03	342
Total $PM_{2.5}$[4]	8.00E-03	342
SO_2[5]	1.40E-03	59.8
H_2SO_4[5]	1.00E-04	4.27
CO_2[6]	118.86	5,075,200
CH_4[7]	2.20E-03	94.1
N_2O[7]	2.20E-04	9.41

1. Emission factor for NO_X based on 3 ppm @ 15% O_2 proposed BACT limit. Permit Condition 3.3.5.a limits NO_X emissions to 279 tpy per block (558 tpy total from all CCCTs).
2. Emission factor for CO based on 12 ppm @ 15% O_2 existing BACT limit.
3. Emission factor for VOC based on 4.5 ppm @ 15% O_2 existing BACT limit.
4. Emission factors for PM, Total PM_{10}, and Total $PM_{2.5}$ based on proposed BACT limit.
5. Emission factors for SO_2 and H_2SO_4 based on GE data.
6. CO_2 Emission factor derived per Appendix G to 40 CFR Part 75, Section 2.3.
CO_2 (lb/MMBtu) = 1,040 scf/MMBtu * 44.0 lb/lb-mole / 385 scf CO_2/lb-mole
7. CH_4 and N_2O emissions factors per Part 98, Subpart C, Table C-2. kg/MMBtu factors converted to lb/MMBtu multiplying by 2.20462 lb/kg
8. Potential Emissions (tpy) = Emission Factor (lb/MMBtu) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton
9. Maximum Annual Operating Capacity anticipated for sustainable operation.

Table B-3. Auxiliary Boilers Potential Criteria Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)	Potential Emissions[8] Auxiliary Boilers (tpy)
NO_X[1]	3.60E-02	6.78
CO[2]	3.70E-02	6.97
VOC[3]	1.27E-02	2.39
PM[4]	1.00E-02	1.88
Total PM_{10}[4]	1.00E-02	1.88
Total $PM_{2.5}$[4]	1.00E-02	1.88
SO_2[5]	6.40E-03	1.21
H_2SO_4[5]	4.50E-05	8.48E-03
CO_2[6]	118.86	22,393
CH_4[7]	2.20E-03	0.42
N_2O[7]	2.20E-04	4.15E-02

1. Emission factor for NO_X based on 30 ppm @ 15% O_2 existing BACT limit.
2. Emission factor for CO based on existing BACT limit.
3. Emission factor for VOC based on existing BACT limit.
4. Emission factors for Total PM, Total PM_{10}, and Total $PM_{2.5}$ based on existing BACT limit.
5. Emission factors for SO_2 and H_2SO_4 based on engineering estimate.
6. CO_2 Emission factor derived per Appendix G to 40 CFR Part 75, Section 2.3.
CO_2 (lb/MMBtu) = 1,040 scf/MMBtu * 44.0 lb/lb-mole / 385 scf CO_2/lb-mole
7. CH_4 and N_2O emissions factors per Part 98, Subpart C, Table C-2. kg/MMBtu factors converted to lb/MMBtu multiplying by 2.20462 lb/kg
8. Potential Emissions (tpy) = Emission Factor (lb/MMBtu) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton

Table B-4. Natural Gas Burning Equipment - Operating Parameters - Design Capacity

Emission Source	Source No.	Fuel Type	Maximum Annual Operating Capacity (Million MMBtu/yr)	Annual Operation (hr/yr)
CT1 Combustion Turbine	CT1	Natural Gas	16.2	8,760
CT2 Combustion Turbine	CT2	Natural Gas	16.2	8,760
CT3 Combustion Turbine	CT3	Natural Gas	16.2	8,760
CT4 Combustion Turbine	CT4	Natural Gas	16.2	8,760
DB1 Duct Burner	DB1	Natural Gas	5.10	8,760
DB2 Duct Burner	DB2	Natural Gas	5.10	8,760
DB3 Duct Burner	DB3	Natural Gas	5.10	8,760
DB4 Duct Burner	DB4	Natural Gas	5.10	8,760
Auxiliary Boiler 1	AUXB1	Natural Gas	0.19	6,000
Auxiliary Boiler 2	AUXB2	Natural Gas	0.19	6,000

Table B-5. Combustion Turbines Potential HAP and TAP Emissions

Pollutant	TAP? (Y/N)	HAP? (Y/N)	Emission Factor[1] (lb/MMBtu)	Potential Emissions[2] Combustion Turbines (tpy)[3]
Lead	Y	Y	--	--
1,3-Butadiene	Y	Y	4.30E-07	1.40E-02
Acetaldehyde	Y	Y	4.00E-05	1.30
Acrolein	Y	Y	6.40E-06	2.08E-01
Benzene	Y	Y	1.20E-05	3.90E-01
Ethylbenzene	Y	Y	3.20E-05	1.04
Formaldehyde[4]	Y	Y	1.56E-04	5.05
Naphthalene	Y	Y	1.30E-06	4.22E-02
Propylene Oxide	Y	Y	2.90E-05	0.94
Toluene	Y	Y	1.30E-04	4.22
Xylenes	Y	Y	6.40E-05	2.08
Hexane[5]	Y	Y	3.06E-05	0.99
Total HAP[6]			**5.01E-04**	**16.29**
Max Single HAP[7]			**1.56E-04**	**5.05**

1. Emission factors per AP-42, Section 3.1 Stationary Gas Turbine, Tables 3.1.-2a and 3.1-3. (April 2000) unless otherwise specified.
2. Potential Emissions (tpy) = Emission Factor (lb/MMBtu) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton
3. Maximum Annual Operating Capacity anticipated for sustainable operation.
4. Emission factor taken from U.S. EPA Inventory Database for Stationary Combustion Turbines, published May 4, 2000.
Emission factors represent test results from General Electric turbines models rated greater than 20 MW.
5. Site specific emission factor based on fuel composition.
6. Total HAP emission factor is the sum of all speciated HAP emission factors.
7. Largest HAP from combustion turbines is formaldehyde.

Table B-6. Potential HAP and TAP Emissions from Duct Burners and Auxiliary Boilers

Pollutant	TAP? (Y/N)	HAP? (Y/N)	Emission Factor[1,2] (lb/MMscf)	Potential Emissions[2] Duct Burners (tpy)[3]	Potential Emissions[2] Auxiliary Boilers (tpy)[3]
2-Methylnapthalene	N	Y	2.40E-05	2.40E-04	4.43E-06
3-Methylchloranthrene	N	Y	1.80E-06	1.80E-05	3.32E-07
7,12-Dimethylbenz(a)anthracene	N	Y	1.60E-05	1.60E-04	2.96E-06
Acenaphthene	N	Y	1.80E-06	1.80E-05	3.32E-07
Acenaphthylene	N	Y	1.80E-06	1.80E-05	3.32E-07
Anthracene	N	Y	2.40E-06	2.40E-05	4.43E-07
Benz(a)anthracene	N	Y	1.80E-06	1.80E-05	3.32E-07
Benzene	Y	Y	2.10E-03	2.10E-02	3.88E-04
Benzo(a)pyrene	N	Y	1.20E-06	1.20E-05	2.22E-07
Benzo(b)fluoranthene	N	Y	1.80E-06	1.80E-05	3.32E-07
Benzo(g,h,i)perylene	N	Y	1.20E-06	1.20E-05	2.22E-07
Benzo(k)fluoranthene	N	Y	1.80E-06	1.80E-05	3.32E-07
Butane	N	N	2.10E+00	21.0	0.39
Chrysene	N	Y	1.80E-06	1.80E-05	3.32E-07
Dibenzo(a,h)anthracene	N	Y	1.20E-06	1.20E-05	2.22E-07
1,4-Dichlorobenzene	Y	Y	1.20E-03	1.20E-02	2.22E-04
Fluoranthene	N	Y	3.00E-06	3.00E-05	5.54E-07
Fluorene	N	Y	2.80E-06	2.80E-05	5.17E-07
Formaldehyde	Y	Y	7.50E-02	0.75	1.39E-02
Hexane[4]	Y	Y	1.85E-01	1.85	3.42E-02
Indeno(1,2,3-cd)pyrene	N	Y	1.80E-06	1.80E-05	3.32E-07
Naphthalene	Y	Y	6.10E-04	6.10E-03	1.13E-04
Pentane	Y	N	2.60E+00	26.01	0.48
Phenanathrene	N	Y	1.70E-05	1.70E-04	3.14E-06
Propane	Y	N	1.60E+00	16.01	0.30
Pyrene	N	Y	5.00E-06	5.00E-05	9.24E-07
Toluene	Y	Y	3.40E-03	3.40E-02	6.28E-04
Arsenic	Y	Y	2.00E-04	2.00E-03	3.69E-05
Barium	Y	N	4.40E-03	4.40E-02	8.13E-04
Beryllium	Y	Y	1.20E-05	1.20E-04	2.22E-06
Cadmium	Y	Y	1.10E-03	1.10E-02	2.03E-04
Chromium	Y	Y	1.40E-03	1.40E-02	2.59E-04
Cobalt	Y	Y	8.40E-05	8.40E-04	1.55E-05
Copper	Y	N	8.50E-04	8.50E-03	1.57E-04
Manganese	Y	Y	3.80E-04	3.80E-03	7.02E-05
Mercury	Y	Y	2.60E-04	2.60E-03	4.80E-05
Molybdenum	Y	N	1.10E-03	1.10E-02	2.03E-04
Nickel	Y	Y	2.10E-03	2.10E-02	3.88E-04
Selenium	Y	Y	2.40E-05	2.40E-04	4.43E-06
Total HAP[5]			**2.73E-01**	**2.73**	**5.05E-02**
Max Single HAP[6]			**1.85E-01**	**1.85**	**3.42E-02**

1. Emission factors per AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-3 and 1.4-4 unless otherwise specified.
2. Potential Emissions (tpy) = Emission Factor (lb/MMscf) / 1,020 (MMBtu/MMscf) * Maximum Annual Operating Capacity (Million MMBtu/yr) * 1E6 MMbtu/ Million MMBtu / 2,000 lb/ton
3. Maximum Annual Operating Capacity anticipated for sustainable operation.
4. Site specific emission factor based on fuel composition.
5. Total HAP emission factor is the sum of all speciated HAP emission factors.
6. Max single HAP from natural gas burning equipment is hexane.

Table B-7. Engines - Operating Parameters - Design Capacity

Emission Source	Source No.	Fuel Type	Heat Input Capacity (MMBtu/hr)	Annual Operation (hr/yr)
Emergency Diesel Generator 1	GEN1	Diesel	4.93	500
Emergency Diesel Generator 2	GEN2	Diesel	4.93	500
Diesel Firewater Pump	FP1	Diesel	1.86	500
Total			**11.71**	**500**

Table B-8. Engines Potential Criteria Pollutant Emissions

Pollutant	Emission Factor[1] (lb/MMBtu)	Potential Emissions[5] Generator Engines (lb/hr)	(tpy)	Emission Factor[2] (lb/MMBtu)	Potential Emissions[5] Fire Pump Engine (lb/hr)	(tpy)
NO_X	3.20	31.54	7.88	4.41	8.18	2.05
CO	0.85	8.38	2.09	0.95	1.76	0.44
VOC	8.19E-02	0.81	0.20	3.50E-01	0.65	0.16
PM[3]	0.10	0.99	0.25	0.31	0.58	0.14
Total PM_{10}[3]	0.10	0.99	0.25	0.31	0.58	0.14
Total $PM_{2.5}$[3]	0.10	0.99	0.25	0.31	0.58	0.14
SO_2	1.52E-03	1.49E-02	3.73E-03	2.90E-01	0.54	0.13
CO_2[4]	163.05	1,607	402	163.05	302	76
CH_4[4]	6.61E-03	6.52E-02	1.63E-02	6.61E-03	1.23E-02	3.07E-03
N_2O[4]	1.32E-03	1.30E-02	3.26E-03	1.32E-03	2.45E-03	6.13E-04

1. Emission factors per AP-42, Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1. (October 1996).
2. Emission factors per AP-42, Section 3.3 Gasoline And Diesel Industrial Engines, Table 3.3-1. (October 1996).
3. PM = Total PM_{10} = Total $PM_{2.5}$
4. CH_4, N_2O, and CO_2 emissions factors per Part 98, Subpart C, Table C-1 and C-2. kg/MMBtu factors converted to lb/MMBtu multiplying by 2.20462 lb/kg.
5. Potential Emissions (lb/hr) = Heat Input Capacity (MMBtu/hr) * Emission Factor (lb/MMBtu)
Potential Emissions (tpy) = Potential Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 lbs/ton

Table B-9. Engines Potential HAP and TAP Emissions

Pollutant	TAP? (Y/N)	HAP? (Y/N)	Emission Factor[1] (lb/MMBtu)	Potential Emissions[3] Generator Engines (lb/hr)	(tpy)	Emission Factor[2] (lb/MMBtu)	Potential Emissions[3] Fire Pump Engine (lb/hr)	(tpy)
Benzene	Y	Y	7.76E-04	7.65E-03	1.91E-03	9.33E-04	1.73E-03	4.33E-04
Toluene	Y	Y	2.81E-04	2.77E-03	6.92E-04	4.09E-04	7.59E-04	1.90E-04
Xylenes	Y	Y	1.93E-04	1.90E-03	4.76E-04	2.85E-04	5.29E-04	1.32E-04
1,3-Butadiene	Y	Y	--	--	--	3.91E-05	7.25E-05	1.81E-05
Formaldehyde	Y	Y	7.89E-05	7.78E-04	1.94E-04	1.18E-03	2.19E-03	5.47E-04
Acetaldehyde	Y	Y	2.52E-05	2.48E-04	6.21E-05	7.67E-04	1.42E-03	3.56E-04
Acrolein	Y	Y	7.88E-06	7.77E-05	1.94E-05	9.25E-05	1.72E-04	4.29E-05
Naphthalene	Y	Y	1.30E-04	1.28E-03	3.20E-04	8.48E-05	1.57E-04	3.93E-05
Total HAP[4]			**1.49E-03**	**1.75E-02**	**4.37E-03**	**3.79E-03**	**4.44E-02**	**1.11E-02**
Max Single HAP[5]			**7.76E-04**	**9.09E-03**	**2.27E-03**	**1.18E-03**	**1.38E-02**	**3.45E-03**

1. Emission factors per AP-42, Section 3.4 Large Stationary Diesel And All Stationary Dual-fuel Engines, Tables 3.4-3 and 3.4-4. (October 1996)
2. Emission factors per AP-42, Section 3.3 Gasoline And Diesel Industrial Engines, Table 3.3-1. (October 1996).
3. Potential Emissions (lb/hr) = Heat Input Capacity (MMBtu/hr) * Emission Factor (lb/MMBtu)
Potential Emissions (tpy) = Potential Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 lbs/ton
4. Total HAP emission factor is the sum of all speciated HAP emission factors.
5. Max single HAP from generator engines is benzene and max single HAP from the fire pump engine is formaldehyde.

Table B-10. Cooling Tower Potential Emissions

Emission Source	Source No.	Circulating Water Flow[1] (gpm)	Total Dissolved Solids[1] (mg/L)	Drift Loss[2] (%)	Drift Mass Flow Rate[3] (gal/hr)	Filterable PM Emissions[4,5] (lb/hr)	(tpy)	Total PM_{10} Emissions[6] (lb/hr)	(tpy)	Total $PM_{2.5}$ Emissions[6] (lb/hr)	(tpy)
Cooling Tower	CT2	173,000	100	0.001%	104	0.09	0.38	8.28E-02	3.63E-01	1.86E-02	8.13E-02
Cooling Tower	CT2	173,000	100	0.001%	104	0.09	0.38	8.28E-02	3.63E-01	1.86E-02	8.13E-02

1. Data provided during site visit to the Thomas A. Smith facility on 1/11/19.
2. Based on vendor documentation.
3. Drift mass flow rate (gal/hr) = Cooling tower capacity (gpm) × 60 min/hour × Drift loss (%).
4. Hourly PM emission rate (lb/hr) = Drift mass flow rate (gal/hr) × TDS (mg/L) × 3.78541 (L/gal) × 2.2045E-06 (lb/mg)
5. Annual PM emission rate (ton/yr) = Hourly emission rate (lb/hr) × 8,760 (hours/yr)/2,000 (lb/ton).
6. PM_{10} and $PM_{2.5}$ emissions are estimated based on the particulate size distribution below, interpolated from data in *Calculating Realistic PM_{10} Emissions from Cooling Towers* by Joel Reisman and Gordon Frisbie, 2002. Detailed derivation of $PM_{10}/PM_{2.5}$ fractions are discussed in Table B-7.

Table B-11. Derivation of $PM_{10}/PM_{2.5}$ Fraction[1]

Drift Droplet Diameter (D_d) (µm)	Drift Droplet Volume[2] ($V_{droplet}$) (µm³)	Drift Droplet Mass[3] ($M_{droplet}$) (µg)	Droplet Particle Mass[4] (M_{TDS}) (µg)	Solid Particle Diameter[5] (D_{TDS}) (µm)	EPRI Cumulative % Mass Smaller[6] (%)	Interpolation Value for $PM_{2.5}$[7] (%)	Interpolation Value for PM_{10}[7] (%)
0	0.00E+00	0.00E+00	0.00E+00	0.000	0	--	--
10	5.24E+02	5.24E-04	5.24E-08	0.357	0	--	--
20	4.19E+03	4.19E-03	4.19E-07	0.714	0.196	--	--
30	1.41E+04	1.41E-02	1.41E-06	1.071	0.226	--	--
40	3.35E+04	3.35E-02	3.35E-06	1.428	0.514	--	--
50	6.54E+04	6.54E-02	6.54E-06	1.784	1.816	--	--
60	1.13E+05	1.13E-01	1.13E-05	2.141	5.702	--	--
70	1.80E+05	1.80E-01	1.80E-05	2.498	21.348	--	--
90	3.82E+05	3.82E-01	3.82E-05	3.212	49.812	21.421	--
110	6.97E+05	6.97E-01	6.97E-05	3.926	70.509	--	--
130	1.15E+06	1.15E+00	1.15E-04	4.639	82.023	--	--
150	1.77E+06	1.77E+00	1.77E-04	5.353	88.012	--	--
180	3.05E+06	3.05E+00	3.05E-04	6.424	91.032	--	--
210	4.85E+06	4.85E+00	4.85E-04	7.495	92.468	--	--
240	7.24E+06	7.24E+00	7.24E-04	8.565	94.091	--	--
300	1.41E+07	1.41E+01	1.41E-03	10.706	96.288	--	95.563
350	2.24E+07	2.24E+01	2.24E-03	12.491	97.011	--	--
400	3.35E+07	3.35E+01	3.35E-03	14.275	98.34	--	--
450	4.77E+07	4.77E+01	4.77E-03	16.060	99.071	--	--
600	1.13E+08	1.13E+02	1.13E-02	21.413	100	--	--

1. Based on the methodology discussed in "Calculating Realistic PM_{10} Emissions from Cooling Towers" by Joel Reisman and Gordon Frisbie, 2002 (the Document).
https://yosemite.epa.gov/r9/air/epss.nsf/6924c72e5ea10d5e882561b100685e04/44841bd36885b15e882579f80062a144/$FILE/Cooling%20Tower%20PM%20Emissions.pdf

Assumptions/helpful equations
Volume of a sphere = $4 \pi r^3/3$

2. $V_{droplet} = 4/3 \pi (D_d/2)^3$ [Equation 2 of the Document]
3. $M_{droplet}$ = density (ρ_w) of water * $V_{droplet} = \rho_w * 4/3 \pi (D_d/2)^3$

$\rho_w =$ 1.00E-06 µg/µm³

4. $M_{TDS} = TDS * M_{droplet}$ [Equation 3 of the Document, with TDS in units of ppm]

TDS = 100 mg/L Total Dissolved Solids Per Table B-6
TDS = 100 ppm

5. $M_{TDS} = (\rho_{TDS})(V_{TDS}) = (\rho_{TDS})(4/3)\pi (D_{TDS}/2)^3$ [Equation 5 of the Document]
Therefore, the equation can be solved for D_{TDS}: $D_{TDS} = \{M_{TDS}/[(\rho_{TDS}) * 4/3 * \pi]\}^{1/3} \times 2$
Assume solid particulates have the same density (ρ_{TDS}) as sodium chloride per the Document: 2.20E-06 µg/µm³
6. Based on drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull, 1999) as documented in Table 1 of the Document.
7. D_{TDS} represents the particle size of collected material in droplet. The EPRI cumulative % mass smaller indicates the percentage of material in that specific water droplet size that has a diameter smaller than D_{TDS}. Therefore, linear interpolation between calculated D_{TDS} is necessary to ascertain the specific mass percentages to estimate PM_{10} and $PM_{2.5}$ emissions. For example, at 1,000 mg/L TDS:
$\%MassPM_{10} = \%Mass\ Less\ than\ 10\ D_{TDS} + [(10 - D_{TDS}\ Less\ Than\ 10) / (D_{TDS}\ Greater\ Than\ 10 - D_{TDS}\ Less\ Than\ 10)] * (\%Mass\ Greater\ than\ 10\ D_{TDS} - \%Mass\ Less\ than\ 10\ D_{TDS})$
i.e. 82.041% = 82.023% + [(10 - 9.995) / (11.533 - 9.995)] * (88.012% - 82.023%)

Table B-12. Potential Emissions of Modified CCCT Systems

Pollutant	Potential Emissions CCCT Systems (tpy)
NO_X[1]	558
CO	1,260
VOC	188
PM	342
Total PM_{10}	342
Total $PM_{2.5}$	342
SO_2	59.8
H_2SO_4	4.27
CO_2	5,075,200
CH_4	94.1
N_2O	9.41
CO_2e[3]	5,080,359
Total HAP	19.0
Max Single HAP[2]	5.80

1. NO_X emissions are limited to 279 tpy per Block containing 2 CCCTs (558 tpy total).
2. Maximum single HAP is Formaldehyde.
3. Total GHG emissions in CO_2e is the sum of the product of each GHG and its respective global warming potential (GWP) per 40 CFR Part 98 Subpart A, Table A-1, effective January 1, 2014.

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

Table B-13. Site-wide Potential to Emit

Pollutant	Potential Emissions Site-wide (tpy)
NO_X	575
CO	1,269
VOC	191
PM	345
Total PM_{10}	345
Total $PM_{2.5}$	344
SO_2	61.1
H_2SO_4	4.28
CO_2	5,098,070
CH_4	94.6
N_2O	9.5
CO_2e[2]	5,103,253
Total HAP	19.1
Max Single HAP[1]	5.82

1. Maximum single HAP is Formaldehyde.
2. Total GHG emissions in CO_2e is the sum of the product of each GHG and its respective global warming potential (GWP) per 40 CFR Part 98 Subpart A, Table A-1, effective January 1, 2014.

Pollutant	GWP
CO_2	1
CH_4	25
N_2O	298

Table B-14. CCCT1 Emission Factors

Pollutant	Emission Factor[1] (lb/MMBtu)
PM	6.30E-03
VOC	1.48E-03
H_2SO_4	1.00E-04

1. VOC, PM, and Sulfuric Acid (H_2SO_4) emission rates are from stack test report (2002), GE data, and engineering estimate.

Table B-15. CCCT1 Monthly Usage and Emissions

Date	Heat Input Rate[1] (MMBtu/month)	SO_2 Mass Emission Rate[2] (Tons/month)	NO_X Mass Emission Rate[3] (Tons/month)	CO Mass Emission Rate[3] (Tons/month)	CO_2 Mass Emission Rate[3] (Tons/month)	PM Mass Emission Rate[4] (Tons/month)	VOC Mass Emission Rate[4] (Tons/month)	H_2SO_4 Mass Emission Rate[4] (Tons/month)
Apr-11	509,214	0.20	3.70	12.84	32,007	1.60	0.38	0.025
May-11	401,285	0.10	3.30	12.93	25,224	1.26	0.30	0.020
Jun-11	776,838	0.20	5.80	23.80	48,828	2.45	0.57	0.039
Jul-11	908,477	0.30	5.60	17.31	53,989	2.86	0.67	0.045
Aug-11	1,195,029	0.40	5.90	8.27	71,019	3.76	0.88	0.060
Sep-11	631,239	0.20	4.20	16.39	37,514	1.99	0.47	0.032
Oct-11	519,054	0.20	2.60	6.01	30,847	1.64	0.38	0.026
Nov-11	670,204	0.20	3.80	4.56	39,828	2.11	0.50	0.034
Dec-11	737,950	0.20	3.50	5.67	43,855	2.32	0.55	0.037
Jan-12	253,934	0.10	1.70	5.31	15,091	0.80	0.19	0.013
Feb-12	98,474	0.00	0.60	1.67	5,853	0.31	0.07	0.005
Mar-12	1,289,231	0.40	6.00	2.04	76,617	4.06	0.95	0.064
Apr-12	531,719	0.20	3.60	10.42	31,599	1.67	0.39	0.027
May-12	759,566	0.20	5.00	15.44	45,142	2.39	0.56	0.038
Jun-12	1,228,029	0.40	5.40	1.06	72,980	3.87	0.91	0.061
Jul-12	1,010,859	0.30	5.00	4.70	60,075	3.18	0.75	0.051
Aug-12	1,337,651	0.40	6.00	1.74	79,494	4.21	0.99	0.067
Sep-12	372,594	0.10	2.00	4.83	22,143	1.17	0.28	0.019
Oct-12	430,631	0.10	2.40	2.93	25,592	1.36	0.32	0.022
Nov-12	33,182	0.00	0.50	2.63	1,972	0.10	0.02	0.002
Dec-12	1,214,360	0.40	5.00	1.34	72,167	3.83	0.90	0.061
Jan-13	989,526	0.30	4.10	2.43	58,805	3.12	0.73	0.049
Feb-13	0	0.00	0.00	0.00	0	0.00	0.00	0.000
Mar-13	125,542	0.00	0.80	2.05	7,461	0.40	0.09	0.006

1. Monthly heat input recorded and provided by OPC.
2. SO_2 and CO_2 monthly emissions as provided by OPC.
3. NO_X and CO monthly emissions recorded and provided from CEMS data.
4. PM, VOC, and H_2SO_4 monthly emissions are calculated as follows:
Mass Emission Rate (tons/month) = Heat Input Rate (MMBtu/month) * Emission Factor (lb/MMBtu) / 2,000 (lb/ton)

Table B-16. CCCT2 Emission Factors

Pollutant	Emission Factor[1] (lb/MMBtu)
PM	6.30E-03
VOC	1.48E-03
H_2SO_4	1.00E-04

1. VOC, PM, and Sulfuric Acid (H_2SO_4) emission rates are from stack test report (2002), GE data, and engineering estimate.

Table B-17. CCCT2 Monthly Usage and Emissions

Date	Heat Input Rate[1] (MMBtu/month)	SO_2 Mass Emission Rate[2] (Tons/month)	NO_X Mass Emission Rate[3] (Tons/month)	CO Mass Emission Rate[3] (Tons/month)	CO_2 Mass Emission Rate[3] (Tons/month)	PM Mass Emission Rate[4] (Tons/month)	VOC Mass Emission Rate[4] (Tons/month)	H_2SO_4 Mass Emission Rate[4] (Tons/month)
Apr-11	465,577	0.10	2.80	9.77	29,265	1.47	0.34	0.023
May-11	377,970	0.10	2.30	9.10	23,758	1.19	0.28	0.019
Jun-11	817,216	0.20	4.90	18.07	51,368	2.57	0.60	0.041
Jul-11	892,406	0.30	4.70	13.18	53,034	2.81	0.66	0.045
Aug-11	1,187,548	0.40	5.90	6.34	70,574	3.74	0.88	0.059
Sep-11	616,436	0.20	3.60	12.05	36,634	1.94	0.46	0.031
Oct-11	484,607	0.10	2.50	6.12	28,799	1.53	0.36	0.024
Nov-11	662,346	0.20	3.20	2.81	39,362	2.09	0.49	0.033
Dec-11	747,746	0.20	3.40	2.66	44,438	2.36	0.55	0.037
Jan-12	255,197	0.10	1.60	3.53	15,166	0.80	0.19	0.013
Feb-12	101,699	0.00	0.70	2.34	6,044	0.32	0.08	0.005
Mar-12	1,284,577	0.40	5.90	1.67	76,343	4.05	0.95	0.064
Apr-12	525,094	0.20	3.90	10.14	31,205	1.65	0.39	0.026
May-12	707,256	0.20	4.20	14.77	42,032	2.23	0.52	0.035
Jun-12	1,126,646	0.30	5.50	4.52	66,955	3.55	0.83	0.056
Jul-12	997,234	0.30	5.00	5.07	59,264	3.14	0.74	0.050
Aug-12	1,335,032	0.40	6.30	1.72	79,339	4.21	0.99	0.067
Sep-12	482,896	0.10	2.40	1.47	28,698	1.52	0.36	0.024
Oct-12	288,973	0.10	1.60	4.11	17,174	0.91	0.21	0.014
Nov-12	34,217	0.00	0.40	1.96	2,033	0.11	0.03	0.002
Dec-12	1,231,618	0.40	5.30	1.31	73,192	3.88	0.91	0.062
Jan-13	990,226	0.30	4.20	1.88	58,848	3.12	0.73	0.050
Feb-13	0	0.00	0.00	0.00	0	0.00	0.00	0.000
Mar-13	207,404	0.10	1.90	4.53	12,325	0.65	0.15	0.010

1. Monthly heat input recorded and provided by OPC.
2. SO_2 and CO_2 monthly emissions as provided by OPC.
3. NO_X and CO monthly emissions recorded and provided from CEMS data.
4. PM, VOC, and H_2SO_4 monthly emissions are calculated as follows:
Mass Emission Rate (tons/month) = Heat Input Rate (MMBtu/month) * Emission Factor (lb/MMBtu) / 2,000 (lb/ton)

Table B-18. CCCT3 Emission Factors

Pollutant	Emission Factor[1] (lb/MMBtu)
PM	6.30E-03
VOC	1.48E-03
H_2SO_4	1.00E-04

1. VOC, PM, and Sulfuric Acid (H_2SO_4) emission rates are from stack test report (2002), GE data, and engineering estimate.

Table B-19. CCCT3 Monthly Usage and Emissions

Date	Heat Input Rate[1] (MMBtu/month)	SO_2 Mass Emission Rate[2] (Tons/month)	NO_X Mass Emission Rate[3] (Tons/month)	CO Mass Emission Rate[3] (Tons/month)	CO_2 Mass Emission Rate[3] (Tons/month)	PM Mass Emission Rate[4] (Tons/month)	VOC Mass Emission Rate[4] (Tons/month)	H_2SO_4 Mass Emission Rate[4] (Tons/month)
Apr-11	377,227	0.10	2.60	12.67	23,711	1.19	0.28	0.019
May-11	678,621	0.20	4.40	14.08	42,656	2.14	0.50	0.034
Jun-11	862,246	0.30	5.30	17.36	54,197	2.72	0.64	0.043
Jul-11	793,051	0.20	4.80	13.77	47,130	2.50	0.59	0.040
Aug-11	969,261	0.30	5.50	15.20	57,603	3.05	0.72	0.048
Sep-11	211,995	0.10	1.40	6.66	12,599	0.67	0.16	0.011
Oct-11	365,256	0.10	1.80	3.87	21,707	1.15	0.27	0.018
Nov-11	62,810	0.00	0.40	2.55	3,733	0.20	0.05	0.003
Dec-11	6,719	0.00	0.20	1.28	399	0.02	0.00	0.000
Jan-12	244,126	0.10	1.50	4.53	14,508	0.77	0.18	0.012
Feb-12	422,101	0.10	2.20	3.79	25,085	1.33	0.31	0.021
Mar-12	52,916	0.00	0.40	1.56	3,145	0.17	0.04	0.003
Apr-12	819,552	0.20	4.30	7.24	48,705	2.58	0.61	0.041
May-12	786,897	0.20	3.80	7.96	46,765	2.48	0.58	0.039
Jun-12	721,770	0.20	3.50	4.78	42,894	2.27	0.53	0.036
Jul-12	1,182,727	0.40	5.70	5.86	70,289	3.73	0.88	0.059
Aug-12	665,960	0.20	4.40	15.05	39,577	2.10	0.49	0.033
Sep-12	722,342	0.20	4.10	7.79	42,927	2.28	0.53	0.036
Oct-12	1,061,542	0.30	5.00	4.46	63,086	3.34	0.79	0.053
Nov-12	90,259	0.00	0.40	0.09	5,364	0.28	0.07	0.005
Dec-12	21,738	0.00	0.40	1.63	1,292	0.07	0.02	0.001
Jan-13	256,758	0.10	1.40	2.54	15,259	0.81	0.19	0.013
Feb-13	532,093	0.20	2.70	3.02	31,622	1.68	0.39	0.027
Mar-13	315,847	0.10	1.40	0.47	18,770	0.99	0.23	0.016

1. Monthly heat input recorded and provided by OPC.
2. SO_2 and CO_2 monthly emissions as provided by OPC.
3. NO_X and CO monthly emissions recorded and provided from CEMS data.
4. PM, VOC, and H_2SO_4 monthly emissions are calculated as follows:
Mass Emission Rate (tons/month) = Heat Input Rate (MMBtu/month) * Emission Factor (lb/MMBtu) / 2,000 (lb/ton)

Table B-20. CCCT4 Emission Factors

Pollutant	Emission Factor[1] (lb/MMBtu)
PM	6.30E-03
VOC	1.48E-03
H_2SO_4	1.00E-04

1. VOC, PM, and Sulfuric Acid (H_2SO_4) emission rates are from stack test report (2002), GE data, and engineering estimate.

Table B-21. CCCT4 Monthly Usage and Emissions

Date	Heat Input Rate[1] (MMBtu/month)	SO_2 Mass Emission Rate[2] (Tons/month)	NO_X Mass Emission Rate[3] (Tons/month)	CO Mass Emission Rate[3] (Tons/month)	CO_2 Mass Emission Rate[3] (Tons/month)	PM Mass Emission Rate[4] (Tons/month)	VOC Mass Emission Rate[4] (Tons/month)	H_2SO_4 Mass Emission Rate[4] (Tons/month)
Apr-11	226,634	0.10	1.70	6.55	14,245	0.71	0.17	0.011
May-11	620,908	0.20	3.50	13.72	39,029	1.96	0.46	0.031
Jun-11	759,409	0.20	4.40	16.37	47,735	2.39	0.56	0.038
Jul-11	710,468	0.20	3.90	11.53	42,223	2.24	0.53	0.036
Aug-11	733,966	0.20	4.10	14.15	43,618	2.31	0.54	0.037
Sep-11	233,044	0.10	1.40	6.75	13,850	0.73	0.17	0.012
Oct-11	444,020	0.10	2.30	4.48	26,388	1.40	0.33	0.022
Nov-11	58,974	0.00	0.30	1.54	3,505	0.19	0.04	0.003
Dec-11	7,367	0.00	0.20	1.41	438	0.02	0.01	0.000
Jan-12	209,293	0.10	1.60	4.58	12,438	0.66	0.15	0.010
Feb-12	425,258	0.10	2.00	1.84	25,272	1.34	0.31	0.021
Mar-12	318,442	0.10	2.00	6.19	18,925	1.00	0.24	0.016
Apr-12	522,451	0.20	2.70	8.72	31,049	1.65	0.39	0.026
May-12	741,808	0.20	3.10	6.30	44,086	2.34	0.55	0.037
Jun-12	489,645	0.10	2.60	7.50	29,099	1.54	0.36	0.024
Jul-12	1,041,751	0.30	4.80	5.10	61,911	3.28	0.77	0.052
Aug-12	495,142	0.10	2.80	10.68	29,426	1.56	0.37	0.025
Sep-12	784,387	0.20	4.00	7.26	46,615	2.47	0.58	0.039
Oct-12	754,874	0.20	3.70	5.11	44,862	2.38	0.56	0.038
Nov-12	0	0.00	0.00	0.00	0	0.00	0.00	0.000
Dec-12	0	0.00	0.00	0.00	0	0.00	0.00	0.000
Jan-13	242,082	0.10	1.60	2.36	14,386	0.76	0.18	0.012
Feb-13	403,351	0.10	2.00	1.45	23,970	1.27	0.30	0.020
Mar-13	313,733	0.10	1.40	0.86	18,645	0.99	0.23	0.016

1. Monthly heat input recorded and provided by OPC.
2. SO_2 and CO_2 monthly emissions as provided by OPC.
3. NO_X and CO monthly emissions recorded and provided from CEMS data.
4. PM, VOC, and H_2SO_4 monthly emissions are calculated as follows:
Mass Emission Rate (tons/month) = Heat Input Rate (MMBtu/month) * Emission Factor (lb/MMBtu) / 2,000 (lb/ton)

Table B-22. Combined Baseline Actual Emissions

Date	Monthly Emissions[1] SO_2 (Tons/month)	NO_X (Tons/month)	CO (Tons/month)	CO_2 (Tons/month)	PM (Tons/month)	VOC (Tons/month)	H_2SO_4 (Tons/month)
Apr-11	0.50	10.80	41.83	99,228	4.97	1.17	0.079
May-11	0.60	13.50	49.83	130,667	6.55	1.54	0.104
Jun-11	0.90	20.40	75.60	202,129	10.13	2.38	0.161
Jul-11	1.00	19.00	55.80	196,376	10.41	2.45	0.165
Aug-11	1.30	21.40	43.96	242,814	12.87	3.02	0.204
Sep-11	0.60	10.60	41.85	100,596	5.33	1.25	0.085
Oct-11	0.50	9.20	20.48	107,741	5.71	1.34	0.091
Nov-11	0.40	7.70	11.45	86,428	4.58	1.08	0.073
Dec-11	0.40	7.30	11.02	89,130	4.72	1.11	0.075
Jan-12	0.40	6.40	17.95	57,203	3.03	0.71	0.048
Feb-12	0.20	5.50	9.63	62,254	3.30	0.78	0.052
Mar-12	0.90	14.30	11.46	175,030	9.28	2.18	0.147
Apr-12	0.80	14.50	36.52	142,558	7.56	1.78	0.120
May-12	0.80	16.10	44.47	178,024	9.44	2.22	0.150
Jun-12	1.00	17.00	17.85	211,929	11.23	2.64	0.178
Jul-12	1.30	20.50	20.71	251,539	13.33	3.13	0.212
Aug-12	1.10	19.50	29.18	227,836	12.08	2.84	0.192
Sep-12	0.60	12.50	21.35	140,383	7.44	1.75	0.118
Oct-12	0.70	12.70	16.60	150,713	7.99	1.88	0.127
Nov-12	0.00	1.30	4.68	9,369	0.50	0.12	0.008
Dec-12	0.80	10.70	4.28	146,651	7.77	1.83	0.123
Jan-13	0.80	11.30	9.22	147,298	7.81	1.83	0.124
Feb-13	0.30	4.70	4.47	55,592	2.95	0.69	0.047
Mar-13	0.30	5.50	7.92	57,201	3.03	0.71	0.048
Baseline Actual Emissions[2]	**8.10**	**146.20**	**304.05**	**1,634,344**	**86.00**	**20.20**	**1.37**

1. Monthly emissions are the sum of the monthly emissions of CCCT1, CCCT2, CCCT3, and CCCT4.
2. Baseline actual emissions are the maximum 24-month annual average emissions for each pollutant.

Table B-23. Seasonal Facility-Wide Baseline Emissions During the Baseline Period[1]

Date	Monthly Emissions[1] SO_2 (Tons/month)	NO_X (Tons/month)	CO (Tons/month)	CO_2 (Tons/month)	PM (Tons/month)	VOC (Tons/month)	H_2SO_4 (Tons/month)
Apr-11	0.60	13.50	49.83	130,667	6.55	1.54	0.104
May-11	0.60	13.50	49.83	130,667	6.55	1.54	0.104
Jun-11	1.30	21.40	75.60	242,814	12.87	3.02	0.204
Jul-11	1.30	21.40	75.60	242,814	12.87	3.02	0.204
Aug-11	1.30	21.40	75.60	242,814	12.87	3.02	0.204
Sep-11	0.60	10.60	41.85	107,741	5.71	1.34	0.091
Oct-11	0.60	10.60	41.85	107,741	5.71	1.34	0.091
Nov-11	0.60	10.60	41.85	107,741	5.71	1.34	0.091
Dec-11	0.40	7.30	17.95	89,130	4.72	1.11	0.075
Jan-12	0.40	7.30	17.95	89,130	4.72	1.11	0.075
Feb-12	0.40	7.30	17.95	89,130	4.72	1.11	0.075
Mar-12	0.90	16.10	44.47	178,024	9.44	2.22	0.150
Apr-12	0.90	16.10	44.47	178,024	9.44	2.22	0.150
May-12	0.90	16.10	44.47	178,024	9.44	2.22	0.150
Jun-12	1.30	20.50	29.18	251,539	13.33	3.13	0.212
Jul-12	1.30	20.50	29.18	251,539	13.33	3.13	0.212
Aug-12	1.30	20.50	29.18	251,539	13.33	3.13	0.212
Sep-12	0.70	12.70	21.35	150,713	7.99	1.88	0.127
Oct-12	0.70	12.70	21.35	150,713	7.99	1.88	0.127
Nov-12	0.70	12.70	21.35	150,713	7.99	1.88	0.127
Dec-12	0.80	11.30	9.22	147,298	7.81	1.83	0.124
Jan-13	0.80	11.30	9.22	147,298	7.81	1.83	0.124
Feb-13	0.80	11.30	9.22	147,298	7.81	1.83	0.124
Mar-13	0.30	5.50	7.92	57,201	3.03	0.71	0.048

1. The seasonal heat input rates and emission rates are equal to the maximum monthly value occurring in each season, applied to all months in that season. The seasons in Georgia are as follows:
   Spring: March - May
   Summer: June - August
   Fall: September - November
   Winter: December - February

Table B-24. Seasonal Facility-Wide Annual Emissions During the Baseline Period[1]

Date	SO_2 (tpy)	NO_X (tpy)	CO (tpy)[2]	CO_2 (tpy)	PM (tpy)	VOC (tpy)	H_2SO_4 (tpy)
Apr-11							
May-11							
Jun-11							
Jul-11							
Aug-11							
Sep-11							
Oct-11							
Nov-11							
Dec-11							
Jan-12							
Feb-12							
Mar-12	9.00	161.00	550.31	1,758,412	92.45	21.72	1.47
Apr-12	9.30	163.60	544.96	1,805,769	95.34	22.40	1.51
May-12	9.60	166.20	539.60	1,853,126	98.22	23.07	1.56
Jun-12	9.60	165.30	493.18	1,861,852	98.69	23.18	1.57
Jul-12	9.60	164.40	446.77	1,870,577	99.15	23.29	1.57
Aug-12	9.60	163.50	400.35	1,879,303	99.61	23.40	1.58
Sep-12	9.70	165.60	379.85	1,922,275	101.89	23.94	1.62
Oct-12	9.80	167.70	359.35	1,965,248	104.17	24.47	1.65
Nov-12	9.90	169.80	338.85	2,008,220	106.44	25.01	1.69
Dec-12	10.30	173.80	330.12	2,066,388	109.53	25.73	1.74
Jan-13	10.70	177.80	321.40	2,124,556	112.61	26.45	1.79
Feb-13	11.10	181.80	312.67	2,182,724	115.69	27.18	1.84
Mar-13	10.50	171.20	276.12	2,061,900	109.29	25.67	1.73
Maximum[3]	**11.10**	**181.80**	**550.31**	**2,182,724**	**115.69**	**27.18**	**1.84**

1. Annual emission rates are calculated by taking the 12-month rolling emissions from Table B-23 ending on the month listed.
2. The baseline period for CO differs from all other pollutants; therefore, the maximum annual emissions of CO are not captured in this table. Emissions of CO are not limiting in consideration of this project.
3. This represents the Emissions that Could Have Been Accommodated.

Table B-25. Facility-Wide Heat Input Rate During the Baseline Period[1]

Date	Original Heat Input Rate (MMBtu/month)	Seasonal Heat Input Rate (MMBtu/month)
Apr-11	1,578,652	2,078,784
May-11	2,078,784	2,078,784
Jun-11	3,215,709	4,085,804
Jul-11	3,304,402	4,085,804
Aug-11	4,085,804	4,085,804
Sep-11	1,692,714	1,812,937
Oct-11	1,812,937	1,812,937
Nov-11	1,454,334	1,812,937
Dec-11	1,499,782	1,499,782
Jan-12	962,550	1,499,782
Feb-12	1,047,532	1,499,782
Mar-12	2,945,166	2,995,527
Apr-12	2,398,816	2,995,527
May-12	2,995,527	2,995,527
Jun-12	3,566,090	4,232,571
Jul-12	4,232,571	4,232,571
Aug-12	3,833,785	4,232,571
Sep-12	2,362,219	2,536,020
Oct-12	2,536,020	2,536,020
Nov-12	157,658	2,536,020
Dec-12	2,467,716	2,478,592
Jan-13	2,478,592	2,478,592
Feb-13	935,444	2,478,592
Mar-13	962,526	962,526

1. The seasonal heat input rates and emission rates are equal to the maximum monthly value occurring in each season, applied to all months in that season.
   Spring: March - May
   Summer: June - August
   Fall: September - November
   Winter: December - February

Table B-26. NSR Applicability Summary

Pollutant	A Baseline Actual Emissions (tpy)	B Projected Actual Emissions[1] (tpy)	C Emissions that Could Have Been Accommodated (tpy)	D = C - A Demand Growth Emissions[2] (tpy)	E = B - A - D Baseline to Projected Actual Emissions Increase[3] (tpy)	NSR Major Modification Threshold (tpy)	NSR Permitting Required?
SO_2	8.10	25.62	11.10	3.00	14.52	40	No
NO_X	146.20	309.30	181.80	35.60	127.50	40	Yes
CO	304.05	597.80	550.31	246.26	47.49	100	No
PM	86.00	269.01	115.69	29.69	153.32	25	Yes
Total PM_{10}[4]	86.00	269.01	115.69	29.69	153.32	15	Yes
Total $PM_{2.5}$[4]	86.00	269.01	115.69	29.69	153.32	10	Yes
VOC	20.20	63.20	27.18	6.97	36.02	40	No
CO_2e[5]	1,636,005	5,080,359	2,182,724	546,718	2,897,635	75,000	Yes
H_2SO_4	1.37	4.27	1.84	0.47	2.43	7	No

1. Projected actual emissions are the maximum projected annual emission rates from 2018 - 2027.
2. Demand Growth Emissions are calculated by taking the emissions that could have been accommodated less the baseline emissions.
3. Baseline to Projected Actual Emissions Increase is calculated by taking the projected actual emissions less the baseline emissions and demand growth emissions.
4. It is conservatively assumed that PM = Total PM_{10} = Total $PM_{2.5}$.
5. NSR permitting can only be triggered for CO_2e if the baseline to projected actual emissions increase is greater than the NSR major modification threshold for another criteria pollutant and CO_2e. CO_2e cannot trigger NSR permitting on its own. CO_2 scaled to CO_2e: CO_2 Baseline Actual Emissions (tpy) * [(CO_2 EF (lb/MMBtu) * 1 (GWP) + CH_4 EF (lb/MMBtu) * 25 (GWP) + N_2O EF (lb/MMBtu) * 298 (GWP)] / [(CO_2 EF (lb/MMBtu) * 1 (GWP)]. See Table B-2 for emission factors.
6. The above would represent Step 1 of a traditional PSD analysis.

APPENDIX C: RBLC SEARCH RESULTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
NEW COVERT GENERATING FACILITY	NEW COVERT GENERATING COMPANY, LLC	MI	John Reese	7/30/2018	Power plant	The equipment consists of three advanced firing temperature Mitsubishi 501G combustion turbines, three heat recovery steam generators supplemented with gas-fired duct burners each with a max firing rate of 256 million British thermal units per hour (MMBtu/hr), three steam turbine generators. Auxiliary equipment includes three mechanical draft evaporative cooling towers, one natural gas auxiliary boiler, one diesel emergency generator, one diesel fire water pump, one aqueous parts cleaner, and one gas heater.	FG-TURB/DB1-3 (3 combined cycle combustion turbine and heat recovery steam generator trains)	15.21	Natural gas	1,230	MW	Three (3) combined-cycle combustion turbine (CT) / heat recovery steam generator (HRSG) trains. Each CT is a natural gas fired Mitsubishi model 501G, equipped with dry low NOx combustor and inlet air evaporative cooling. Each HRSG includes a natural gas fired duct burner with a 256 MMBtu/hr heat input capacity and a dry low NOx burner.	Particulate matter, total 10µ (TPM10)	Use clean fuel (natural gas) and good combustion practices.	10.7	LB/H	HOURLY; EACH CT/HRSG TRAIN
NEW COVERT GENERATING FACILITY	NEW COVERT GENERATING COMPANY, LLC	MI	John Reese	7/30/2018	Power plant	The equipment consists of three advanced firing temperature Mitsubishi 501G combustion turbines, three heat recovery steam generators supplemented with gas-fired duct burners each with a max firing rate of 256 million British thermal units per hour (MMBtu/hr), three steam turbine generators. Auxiliary equipment includes three mechanical draft evaporative cooling towers, one natural gas auxiliary boiler, one diesel emergency generator, one diesel fire water pump, one aqueous parts cleaner, and one gas heater.	FG-TURB/DB1-3 (3 combined cycle combustion turbine and heat recovery steam generator trains)	15.21	Natural gas	1,230	MW	Three (3) combined-cycle combustion turbine (CT) / heat recovery steam generator (HRSG) trains. Each CT is a natural gas fired Mitsubishi model 501G, equipped with dry low NOx combustor and inlet air evaporative cooling. Each HRSG includes a natural gas fired duct burner with a 256 MMBtu/hr heat input capacity and a dry low NOx burner.	Particulate matter, total 2.5µ (TPM2.5)	Use clean fuel (natural gas) and good combustion practices.	10.7	LB/H	HOURLY; EACH CT/HRSG TRAIN
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)	15.21	Natural gas			Two (2) combined-cycle natural gas-fired combustion turbine generators, each with a heat recovery steam generator (CTGHRSG). Plant nominal 1,150 MW electricity production. Turbines are each rated at 3,658 MMBTU/H and HRSG duct burners are each rated at 800 MMBTU/H. The HRSGs are not capable of operating independently from the CTGs.	Particulate matter, filterable (FPM)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	16	LB/H	HOURLY; EACH UNIT
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)	15.21	Natural gas			Two (2) combined-cycle natural gas-fired combustion turbine generators, each with a heat recovery steam generator (CTGHRSG). Plant nominal 1,150 MW electricity production. Turbines are each rated at 3,658 MMBTU/H and HRSG duct burners are each rated at 800 MMBTU/H. The HRSGs are not capable of operating independently from the CTGs.	Particulate matter, total 10µ (TPM10)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	16	LB/H	HOURLY; EACH UNIT
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)	15.21	Natural gas			Two (2) combined-cycle natural gas-fired combustion turbine generators, each with a heat recovery steam generator (CTGHRSG). Plant nominal 1,150 MW electricity production. Turbines are each rated at 3,658 MMBTU/H and HRSG duct burners are each rated at 800 MMBTU/H. The HRSGs are not capable of operating independently from the CTGs.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices, inlet air conditioning and the use of pipeline quality natural gas.	16	LB/H	HOURLY; EACH UNIT
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (South Plant): A combined cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/H (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/H (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR and an oxidation catalyst.	Particulate matter, filterable (FPM)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	5.8	LB/H	HOURLY

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (South Plant): A combined cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/H (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/H (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR and an oxidation catalyst.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.1	LB/H	HOURLY
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (South Plant): A combined cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/H (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/H (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR and an oxidation catalyst.	Particulate matter, total 10µ (TPM10)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.1	LB/H	HOURLY
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (North Plant): A combined-cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	Nominal 500 MW electricity production. Turbine rating of 3,080 MMBTU/hr (HHV) and HRSG duct burner rating of 755 MMBTU/hr (HHV). A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/hr (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/hr (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR, and an oxidation catalyst.	Particulate matter, filterable (FPM)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	5.8	LB/H	HOURLY
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (North Plant): A combined-cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	Nominal 500 MW electricity production. Turbine rating of 3,080 MMBTU/hr (HHV) and HRSG duct burner rating of 755 MMBTU/hr (HHV). A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/hr (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/hr (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR, and an oxidation catalyst.	Particulate matter, total 10µ (TPM10)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.1	LB/H	HOURLY

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (North Plant): A combined-cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	Nominal 500 MW electricity production. Turbine rating of 3,080 MMBTU/hr (HHV) and HRSG duct burner rating of 755 MMBTU/hr (HHV). A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/hr (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/hr (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR, and an oxidation catalyst.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.1	LB/H	HOURLY
PALMDALE ENERGY PROJECT	PALMDALE ENERGY, LLC	CA	Tom Cameron	4/25/2018	645 MW (nominal) Natural Gas-fired Combined Cycle Power Plant, 2 x 1 configuration, auxiliary boiler for faster startup	See also docket: https://www.regulations.gov/docket?D=EPA-R09-OAR-2017-0473. Permit decision was appealed to EPA's Environmental Appeals Board. Board denied review on October 23, 2018. Information available through www.epa.gov/eab and https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/f22b4b245fab46c6852570e6004df1bd/ad735c0b822500258525829d004217eb!OpenDocument.	Combustion Turbines (GEN1 and GEN2)	15.21	Natural Gas	2,217	MMBtu/hr	Each combustion turbine rated at 214 MW, with a maximum heat input rate of 2,217 MMBtu/hr (HHV, at ISO conditions); natural gas-fired Siemens SGT6-5000F; each vents to dedicated Heat Recovery Steam Generator and a shared 276 MW Steam Turbine Generator; 160-ft stack height; 22-ft stack diameter	Particulate matter, filterable (FPM)	Clean fuel and good combustion practices	0.0048	LB/MMBTU	TEST AVERAGE
PALMDALE ENERGY PROJECT	PALMDALE ENERGY, LLC	CA	Tom Cameron	4/25/2018	645 MW (nominal) Natural Gas-fired Combined Cycle Power Plant, 2 x 1 configuration, auxiliary boiler for faster startup	See also docket: https://www.regulations.gov/docket?D=EPA-R09-OAR-2017-0473. Permit decision was appealed to EPA's Environmental Appeals Board. Board denied review on October 23, 2018. Information available through www.epa.gov/eab and https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/f22b4b245fab46c6852570e6004df1bd/ad735c0b822500258525829d004217eb!OpenDocument.	Combustion Turbines (GEN1 and GEN2)	15.21	Natural Gas	2,217	MMBtu/hr	Each combustion turbine rated at 214 MW, with a maximum heat input rate of 2,217 MMBtu/hr (HHV, at ISO conditions); natural gas-fired Siemens SGT6-5000F; each vents to dedicated Heat Recovery Steam Generator and a shared 276 MW Steam Turbine Generator; 160-ft stack height; 22-ft stack diameter	Particulate matter, total 10µ (TPM10)	Clean fuel and good combustion practices	0.0048	LB/MMBTU	TEST AVERAGE
PALMDALE ENERGY PROJECT	PALMDALE ENERGY, LLC	CA	Tom Cameron	4/25/2018	645 MW (nominal) Natural Gas-fired Combined Cycle Power Plant, 2 x 1 configuration, auxiliary boiler for faster startup	See also docket: https://www.regulations.gov/docket?D=EPA-R09-OAR-2017-0473. Permit decision was appealed to EPA's Environmental Appeals Board. Board denied review on October 23, 2018. Information available through www.epa.gov/eab and https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/f22b4b245fab46c6852570e6004df1bd/ad735c0b822500258525829d004217eb!OpenDocument.	Combustion Turbines (GEN1 and GEN2)	15.21	Natural Gas	2,217	MMBtu/hr	Each combustion turbine rated at 214 MW, with a maximum heat input rate of 2,217 MMBtu/hr (HHV, at ISO conditions); natural gas-fired Siemens SGT6-5000F; each vents to dedicated Heat Recovery Steam Generator and a shared 276 MW Steam Turbine Generator; 160-ft stack height; 22-ft stack diameter	Particulate matter, total 2.5µ (TPM2.5)	Clean fuel and good combustion practices	0.0048	LB/MMBTU	TEST AVERAGE
MONTGOMERY COUNTY POWER STATIOIN	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			Combined Cycle Turbine	15.21	NATURAL GAS	2,635	MMBTU/HR/UNIT	Two Mitsubishi M501GAC turbines (without fast start)	Particulate matter, total (TPM)	PIPELINE NATURAL GAS, GOOD COMBUSTION	125.7	TON/YR	
MONTGOMERY COUNTY POWER STATIOIN	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			Combined Cycle Turbine	15.21	NATURAL GAS	2,635	MMBTU/HR/UNIT	Two Mitsubishi M501GAC turbines (without fast start)	Particulate matter, total 10µ (TPM10)	PIPELINE NATURAL GAS, GOOD COMBUSTION	125.7	TON/YR	
MONTGOMERY COUNTY POWER STATIOIN	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			Combined Cycle Turbine	15.21	NATURAL GAS	2,635	MMBTU/HR/UNIT	Two Mitsubishi M501GAC turbines (without fast start)	Particulate matter, total 2.5µ (TPM2.5)	PIPELINE NATURAL GAS, GOOD COMBUSTION	125.7	TON/YR	
HARRISON COUNTY POWER PLANT	ESC HARRISON COUNTY POWER, LLC	WV	Andrew Dorn	3/27/2018	Nominal 640 mWe natural gas-fired combined-cycle power plant. Small sources: Emergency Generator, Fire Water Pump, Fuel Gas Heater not included in RBLC - may request info or see permit for details.		GE 7HA.02 Turbine	15.21	Natural Gas	3,496.2	mmBtu/hr	Nominal 640 mWe All emission limits steady-state and include 1000 mmBtu/hr Duct Burner in operation Short Term startup and shutdown limits in lb/event given in permit.	Particulate matter, total (TPM)	Air Filter, Use of Natural Gas, Good Combustion Practices	18.2	LB/HR	
DANIA BEACH ENERGY CENTER	FLORIDA POWER AND LIGHT COMPANY	FL	John Hampp	12/4/2017	1200 megawatt 2-on-1 combined cycle facility, natural gas-fired, with limited ULSD use. GE 7HA turbines	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.017.AC.D.ZIP	2-on-1 combined cycle unit (GE 7HA)	15.21	Natural gas	4,000	MMBtu/hr	Two nominal 430 MW combustion turbines, coupled to a steam turbine generator	Particulate matter, filterable (FPM)	Clean fuels			

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
DANIA BEACH ENERGY CENTER	FLORIDA POWER AND LIGHT COMPANY	FL	John Hampp	12/4/2017	1200 megawatt 2-on-1 combined cycle facility, natural gas-fired, with limited ULSD use. GE 7HA turbines	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.017.AC.D.ZIP	2-on-1 combined cycle unit (GE 7HA)	15.21	Natural gas	4,000	MMBtu/hr	Two nominal 430 MW combustion turbines, coupled to a steam turbine generator	Particulate matter, total 10µ (TPM10)	Clean fuels			
DANIA BEACH ENERGY CENTER	FLORIDA POWER AND LIGHT COMPANY	FL	John Hampp	12/4/2017	1200 megawatt 2-on-1 combined cycle facility, natural gas-fired, with limited ULSD use. GE 7HA turbines	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.017.AC.D.ZIP	2-on-1 combined cycle unit (GE 7HA)	15.21	Natural gas	4,000	MMBtu/hr	Two nominal 430 MW combustion turbines, coupled to a steam turbine generator	Particulate matter, total 2.5µ (TPM2.5)	Clean fuels			
FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Combined cycle CTG with unfired HRSG)	15.21	Natural gas	1,934.7	MMBTU/H	A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Particulate matter, filterable (FPM)	Good combustion practices and the use of pipeline quality natural gas, combustion inlet air filter.	0.0025	LB/MMBTU	
FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Combined cycle CTG with unfired HRSG)	15.21	Natural gas	1,934.7	MMBTU/H	A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of pipeline quality natural gas, combustion inlet air filter.	0.0066	LB/MMBTU	
FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Combined cycle CTG with unfired HRSG)	15.21	Natural gas	1,934.7	MMBTU/H	A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of pipeline quality natural gas, combustion inlet air filter.	0.0066	LB/MMBTU	
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/o Duct Firing	15.21	Natural Gas	2,969	MMBtu/hr	Throughput is for turbine only	Particulate matter, total 10µ (TPM10)	Good Combustion	0.044	LB/MMBTU	
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/o Duct Firing	15.21	Natural Gas	2,969	MMBtu/hr	Throughput is for turbine only	Particulate matter, total 2.5µ (TPM2.5)	Good Combustion	0.0044	LB/MMBTU	
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/Duct Firing	15.21	Natural Gas	2,639	MMBtu/hr	Duct burner MRC is 946 MMbtu/hr	Particulate matter, total 10µ (TPM10)	Good Combustion	0.005	LB/MMBTU	
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/Duct Firing	15.21	Natural Gas	2,639	MMBtu/hr	Duct burner MRC is 946 MMbtu/hr	Particulate matter, total 2.5µ (TPM2.5)	Good Combustion	0.005	LB/MMBTU	
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Particulate matter, total (TPM)	Pipeline quality natural gas; good combustion practices			
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas; good combustion practices			
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas; good combustion practices			
CHOCOLATE BAYOU STEAM GENERATING (CBSG) STATION	INEOS USALLC	TX	Theresa Vitek	2/17/2017	support facility providing steam and electricity		Combined Cycle Cogeneration	15.21	NATURAL GAS	50	MW	2 UNITS EACH 50 MW GE LM6000	Particulate matter, total (TPM)		6.98	LB/H	
CHOCOLATE BAYOU STEAM GENERATING (CBSG) STATION	INEOS USALLC	TX	Theresa Vitek	2/17/2017	support facility providing steam and electricity		Combined Cycle Cogeneration	15.21	NATURAL GAS	50	MW	2 UNITS EACH 50 MW GE LM6000	Particulate matter, filterable 10µ (FPM10)		6.98	LB/H	
CHOCOLATE BAYOU STEAM GENERATING (CBSG) STATION	INEOS USALLC	TX	Theresa Vitek	2/17/2017	support facility providing steam and electricity		Combined Cycle Cogeneration	15.21	NATURAL GAS	50	MW	2 UNITS EACH 50 MW GE LM6000	Particulate matter, filterable 2.5µ (FPM2.5)		6.98	LB/H	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
INDECK NILES, LLC	INDECK NILES, LLC	MI	Michael Dubois	1/4/2017	Natural gas combined cycle power plant.	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)	15.21	Natural gas	8,322	MMBTU/H	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The throughput capacity is 3421 MMBTU/H for each turbine, and 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains.	Particulate matter, filterable (FPM)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	9.9	LB/H	TEST PROTOCOL WILL SPECIFY AVG TIME
INDECK NILES, LLC	INDECK NILES, LLC	MI	Michael Dubois	1/4/2017	Natural gas combined cycle power plant.	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)	15.21	Natural gas	8,322	MMBTU/H	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The throughput capacity is 3421 MMBTU/H for each turbine, and 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains.	Particulate matter, total 10µ (TPM10)	Good combustion practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.8	LB/H	TEST PROTOCOL WILL SPECIFY AVG TIME
INDECK NILES, LLC	INDECK NILES, LLC	MI	Michael Dubois	1/4/2017	Natural gas combined cycle power plant.	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)	15.21	Natural gas	8,322	MMBTU/H	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The throughput capacity is 3421 MMBTU/H for each turbine, and 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains.	Particulate matter, total 2.5µ (TPM2.5)	Good Combustion Practices, inlet air conditioning, and the use of pipeline quality natural gas.	19.8	LB/H	TEST PROTOCOL WILL SPECIFY AVG TIME
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG (2 Combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/H, each	Two combined cycle natural gas fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period.	Particulate matter, filterable (FPM)	Good combustion practices and the use of pipeline quality natural gas.	0.007	LB/MMBTU	TEST PROTOCOL WILL SPECIFY AVG TIME
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG (2 Combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/H, each	Two combined cycle natural gas fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period.	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of pipeline quality natural gas.	0.014	LB/MMBTU	TEST PROTOCOL WILL SPECIFY AVG TIME

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG (2 Combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/H, each	Two combined cycle natural gas fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of pipeline quality natural gas.	0.014	LB/MMBTU	TEST PROTOCOL WILL SPECIFY AVG TIME
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG with duct burner NG only	15.21	Natural Gas	3,338	MMBtu/hr	Emission limits are for each turbine operating with duct burner and do not include startup/shutdown emissions. Tons per year limits is a cumulative value for all three CCCT. CEMS for NOx, CO, and O2. Each CCCT and duct burner have 5 operational scenarios: 1 CCCT with duct burner fired - fueled by NG only 2 CCCT with duct burner fired - fueled by NG blend with ethane 3 CCCT without duct burner fired - fueled by NG only 4 CCCT without duct burner fired - fueled by NG blend with ethane 5 CCCT without duct burner fired - fueled by ULSD (Limited to emergency use only)	Particulate matter, total (TPM)	Low sulfur fuel, good combustion practices	0.005	LB/MMBTU	
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG with duct burner NG only	15.21	Natural Gas	3,338	MMBtu/hr	Emission limits are for each turbine operating with duct burner and do not include startup/shutdown emissions. Tons per year limits is a cumulative value for all three CCCT. CEMS for NOx, CO, and O2. Each CCCT and duct burner have 5 operational scenarios: 1 CCCT with duct burner fired - fueled by NG only 2 CCCT with duct burner fired - fueled by NG blend with ethane 3 CCCT without duct burner fired - fueled by NG only 4 CCCT without duct burner fired - fueled by NG blend with ethane 5 CCCT without duct burner fired - fueled by ULSD (Limited to emergency use only)	Particulate matter, total 10µ (TPM10)	Low sulfur fuel, good combustion practices	0.005	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG with duct burner NG only	15.21	Natural Gas	3,338	MMBtu/hr	Emission limits are for each turbine operating with duct burner and do not include startup/shutdown emissions. Tons per year limits is a cumulative value for all three CCCT. CEMS for NOx, CO, and O2. Each CCCT and duct burner have 5 operational scenarios: 1 CCCT with duct burner fired - fueled by NG only 2 CCCT with duct burner fired - fueled by NG blend with ethane 3 CCCT without duct burner fired - fueled by NG only 4 CCCT without duct burner fired - fueled by NG blend with ethane 5 CCCT without duct burner fired - fueled by ULSD (Limited to emergency use only)	Particulate matter, total 2.5µ (TPM2.5)	Low sulfur fuel, good combustion practices	0.005	LB/MMBTU	
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG without duct burner NG only	15.21	Natural gas			Emission limits are for each turbine fueled by NG and operating without duct burner being fired and do not include startup/shutdown emissions.	Particulate matter, total (TPM)	Low sulfur fuels and good combustion practices	0.0068	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG without duct burner NG only	15.21	Natural gas			Emission limits are for each turbine fueled by NG and operating without duct burner being fired and do not include startup/shutdown emissions.	Particulate matter, total 2.5µ (TPM2.5)	Low sulfur fuels and good combustion practices	0.0068	LB/MMBTU	
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG without duct burner NG only	15.21	Natural gas			Emission limits are for each turbine fueled by NG and operating without duct burner being fired and do not include startup/shutdown emissions.	Particulate matter, total 10µ (TPM10)	Low sulfur fuels and good combustion practices	0.0068	LB/MMBTU	
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1A	15.21	Natural Gas	3,625	MMBTU/hr		Particulate matter, filterable 10µ (FPM10)	Good combustion practices and clean burning fuels (natural gas)	17.52	LB/H	HOURLY MAXIMUM
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1A	15.21	Natural Gas	3,625	MMBTU/hr		Particulate matter, filterable 2.5µ (FPM2.5)	Good combustion practices and clean burning fuels (natural gas)	17.52	LB/H	HOURLY MAXIMUM
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1B	15.21	Natural Gas	3,625	MMBTU/hr		Particulate matter, filterable 10µ (FPM10)	Good combustion practices and clean burning fuels (natural gas)	17.52	LB/H	HOURLY MAXIMUM
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1B	15.21	Natural Gas	3,625	MMBTU/hr		Particulate matter, filterable 2.5µ (FPM2.5)	Good combustion practices and clean burning fuel (natural gas)	17.52	LB/H	HOURLY MAXIMUM

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas with Duct Burner	15.21	natural gas	4,000	h/yr		Particulate matter, total 2.5µ (TPM2.5)	COMPLIANCE BY STACK TESTING	18.3	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas with Duct Burner	15.21	natural gas	4,000	h/yr		Particulate matter, filterable (FPM)	USE OF NATURAL GAS A CLEAN BURNING FUEL	10.4	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas with Duct Burner	15.21	natural gas	4,000	h/yr		Particulate matter, total 10µ (TPM10)	COMPLIANCE BY STACK TESTING	18.3	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas without Duct Burner	15.21	Natural Gas	8,040	H/YR		Particulate matter, filterable (FPM)	USE OF NATURAL GAS A CLEAN BURNING FUEL	4.4	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas without Duct Burner	15.21	Natural Gas	8,040	H/YR		Particulate matter, total 10µ (TPM10)	USE OF NATURAL GAS A CLEAN BURNING FUEL	11.7	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas without Duct Burner	15.21	Natural Gas	8,040	H/YR		Particulate matter, total 2.5µ (TPM2.5)	USE OF NATURAL GAS A CLEAN BURNING FUEL	11.7	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
GREENSVILLE POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Mark Mitchell	6/17/2016	The proposed project will be a new, nominal 1,600 MW combined-cycle electrical power generating facility utilizing three combustion turbines each with a duct-fired heat recovery steam generator (HRSG) with a common reheat condensing steam turbine generator (3 on 1 configuration). The proposed fuel for the turbines and duct burners is pipeline-quality natural gas.		COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)	15.21	natural gas	3,227	MMBTU/HR	3227 MMBTU/HR CT with 500 MMBTU/HR Duct Burner, 3 on 1 configuration.	Particulate matter, filterable 2.5µ (FPM2.5)	Pipeline Quality Natural Gas	0.0039	LB/MMBTU	AVG OF 3 TEST RUNS
GREENSVILLE POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Mark Mitchell	6/17/2016	The proposed project will be a new, nominal 1,600 MW combined-cycle electrical power generating facility utilizing three combustion turbines each with a duct-fired heat recovery steam generator (HRSG) with a common reheat condensing steam turbine generator (3 on 1 configuration). The proposed fuel for the turbines and duct burners is pipeline-quality natural gas.		COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)	15.21	natural gas	3,227	MMBTU/HR	3227 MMBTU/HR CT with 500 MMBTU/HR Duct Burner, 3 on 1 configuration.	Particulate matter, total 10µ (TPM10)	Low sulfur/carbon fuel and good combustion practices	0.0039	LB/MMBTU	AVG OF 3 TEST RUNS
JOHNSONVILLE COGENERATION	TENNESSEE VALLEY AUTHORITY	TN	Clay Cherry	4/19/2016	Existing gas-fired combustion turbine with new heat recovery steam generator (HRSG) with duct burner and two new gas-fired auxiliary boilers.	Facility-wide emissions increases do not include decreases due to shutdown of coal-fired units.	Natural Gas-Fired Combustion Turbine with HRSG	15.21	Natural Gas	1,339	MMBtu/hr	Turbine throughput is 1019.7 MMBtu/hr when burning natural gas and 1083.7 MMBtu/hr when burning No. 2 oil. Duct burner throughput is 319.3 MMBtu/hr. Duct burner firing will occur during natural gas combustion only.	Particulate matter, total (TPM)	Good combustion design and practices	0.005	LB/MMBTU	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/yr.	Particulate matter, total 10µ (TPM10)	GOOD COMBUSTION PRACTICES, LOW SULFUR FUEL	19.35	LB/H	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/yr.	Particulate matter, total 2.5µ (TPM2.5)	GOOD COMBUSTION PRACTICES AND LOW SULFUR FUEL	19.35	LB/H	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine with Duct Burner firing natural gas	15.21	Natural Gas				Particulate matter, filterable (FPM)	Use of clean burning fuel like natural gas	12	LB/H	AV OF THREE ONE H STACK TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine with Duct Burner firing natural gas	15.21	Natural Gas				Particulate matter, total 10µ (TPM10)	Use of natural gas a clean burning fuel	22.6	LB/H	AV OF THREE ONE H STACK TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine with Duct Burner firing natural gas	15.21	Natural Gas				Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas a clean burning fuel	22.6	LB/H	AV OF THREE ONE H STACK TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine without Duct Burner Firing Natural Gas	15.21	Natural Gas	28,169,501	MMBTU/YR	Natural Gas Usage: <=28,169,501 MMBtu/year which includes maximum ultra low sulfur distillate oil usage of =2,371,943 MMBTU/year	Particulate matter, filterable (FPM)	USE OF NATURAL GAS A CLEAN BURNING FUEL	4.7	LB/H	AV OF THREE ONE H STACK TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine without Duct Burner Firing Natural Gas	15.21	Natural Gas	28,169,501	MMBTU/YR	Natural Gas Usage: <=28,169,501 MMBtu/year which includes maximum ultra low sulfur distillate oil usage of =2,371,943 MMBTU/year	Particulate matter, total 10µ (TPM10)	Use of natural gas a clean burning fuel	14.4	LB/H	AV OF THREE ONE H STACK TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (gpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine without Duct Burner Firing Natural Gas	15.21	Natural Gas	28,169,501	MMBTU/YR	Natural Gas Usage: <=28,169,501 MMBtu/year which includes maximum ultra low sulfur distillate oil usage of =2,371,943 MMBTU/year	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas a clean burning fuel	14.4	LB/H	AV OF THREE ONE H STACK TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
OKEECHOBEE CLEAN ENERGY CENTER	FLORIDA POWER & LIGHT	FL	John Hampp	3/9/2016	Fossil-fueled power plant, consisting of a 3-on-1 combined cycle unit and auxiliary equipment. The combined cycle unit consists of three GE 7HA.02 turbines, each with nominal generating capacity of 350 MW. The total generating capacity for the combined cycle unit is 1,600 MW.	Technical evaluation of project available at http://depedms.dep.state.fl.us/Oculus/servlet/shell?command=getEntity&[guid=75.89000.1]&[profile=Permitting_Authorization]	Combined-cycle electric generating unit	15.21	Natural gas	3,096	MMBtu/hr per turbine	3-on-1 combined cycle unit. GE 7HA.02 turbines, approximately 350 MW per turbine. Total unit generating capacity is approximately 1,600 MW. Primarily fueled with natural gas. Permitted to burn the base-load equivalent of 500 hr/yr per turbine on ULSD.	Particulate matter, total (TPM)	Use of clean fuels	2	GRAIN S/100 SCF GAS	FOR NATURAL GAS
OKEECHOBEE CLEAN ENERGY CENTER	FLORIDA POWER & LIGHT	FL	John Hampp	3/9/2016	Fossil-fueled power plant, consisting of a 3-on-1 combined cycle unit and auxiliary equipment. The combined cycle unit consists of three GE 7HA.02 turbines, each with nominal generating capacity of 350 MW. The total generating capacity for the combined cycle unit is 1,600 MW.	Technical evaluation of project available at http://depedms.dep.state.fl.us/Oculus/servlet/shell?command=getEntity&[guid=75.89000.1]&[profile=Permitting_Authorization]	Combined-cycle electric generating unit	15.21	Natural gas	3,096	MMBtu/hr per turbine	3-on-1 combined cycle unit. GE 7HA.02 turbines, approximately 350 MW per turbine. Total unit generating capacity is approximately 1,600 MW. Primarily fueled with natural gas. Permitted to burn the base-load equivalent of 500 hr/yr per turbine on ULSD.	Particulate matter, total 10µ (TPM10)	Use of clean fuels	2	GR. S/100 SCF GAS	FOR NATURAL GAS
OKEECHOBEE CLEAN ENERGY CENTER	FLORIDA POWER & LIGHT	FL	John Hampp	3/9/2016	Fossil-fueled power plant, consisting of a 3-on-1 combined cycle unit and auxiliary equipment. The combined cycle unit consists of three GE 7HA.02 turbines, each with nominal generating capacity of 350 MW. The total generating capacity for the combined cycle unit is 1,600 MW.	Technical evaluation of project available at http://depedms.dep.state.fl.us/Oculus/servlet/shell?command=getEntity&[guid=75.89000.1]&[profile=Permitting_Authorization]	Combined-cycle electric generating unit	15.21	Natural gas	3,096	MMBtu/hr per turbine	3-on-1 combined cycle unit. GE 7HA.02 turbines, approximately 350 MW per turbine. Total unit generating capacity is approximately 1,600 MW. Primarily fueled with natural gas. Permitted to burn the base-load equivalent of 500 hr/yr per turbine on ULSD.	Particulate matter, total 2.5µ (TPM2.5)	Use of clean fuels	2	GR. S/100 SCF GAS	FOR NATURAL GAS
DECORDOVA STEAM ELECTRIC STATION	DECORDOVA II POWER COMPANY LLC	TX	Paul Coon	3/8/2016	The DeCordova Station will consist of two combustion turbine generators (CTGs) operating in simple cycle or combined cycle modes. The gas turbines will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE). Simple cycle operations limited to 2,500 hr/yr.	Particulate matter, total 10µ (TPM10)	GOOD COMBUSTION PRACTICES AND LOW SULFUR FUEL	35.47	LB/H	
DECORDOVA STEAM ELECTRIC STATION	DECORDOVA II POWER COMPANY LLC	TX	Paul Coon	3/8/2016	The DeCordova Station will consist of two combustion turbine generators (CTGs) operating in simple cycle or combined cycle modes. The gas turbines will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE). Simple cycle operations limited to 2,500 hr/yr.	Particulate matter, total 2.5µ (TPM2.5)	GOOD COMBUSTION PRACTICES AND LOW SULFUR FUEL	35.47	LB/H	
TENASKA PA PARTNERS/WEST MORELAND GEN FAC	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Particulate matter, total (TPM)	Good combustion practices with the use of low ash/sulfur fuels	0.0039	LB/MMBTU	
TENASKA PA PARTNERS/WEST MORELAND GEN FAC	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Particulate matter, total 10µ (TPM10)	Good combustion practices with the use of low ash/sulfur fuels	0.0039	LB/MMBTU	
TENASKA PA PARTNERS/WEST MORELAND GEN FAC	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices	0.0039	LB/MMBTU	
CRICKET VALLEY ENERGY CENTER	CRICKET VALLEY ENERGY CENTER LLC	NY		2/3/2016	Cricket Valley Energy Center LLC (CVEC) constructed the Cricket Valley Energy Center (the Facility), a nominal net 1,000-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located in Dover, Dutchess County, New York. The Facility consists of three General Electric (GE) Model 7FA.05 combustion turbine generators (CTGs) operating in combined-cycle mode with supplemental firing of the heat recovery steam generators (HRSGs); natural gas will be the sole fuel fired in the CTGs and duct burners. The Facility will include a natural gas-fired auxiliary boiler, four ultra-low sulfur distillate (ULSD) fired black-start generator engines and a ULSD-fired emergency fire pump engine. In addition to the air emitting equipment, the Facility will include three steam turbine generators (STGs), an air cooled condenser (ACC) and associated auxiliary equipment and systems. Each combined cycle generating unit consisting of the CTG, HRSG and STG will be exhausted through its own stack. Air emissions from the proposed Facility primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary combustion sources. Dutchess County is designated as in attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants with the exception of ozone. Based upon the potential to emit (PTE) estimates, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements for emissions of carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM) with a diameter equal to or less than 10 microns (PM10), PM with a diameter equal to or less than 2.5 microns (PM2.5); greenhouse gases (GHG); sulfuric acid mist (H2SO4); and volatile organic compounds (VOC). In accordance with the NYSDECs Nonattainment New Source Review (NNSR) permitting program, the Facility is also subject to NNSR for emissions of NOx and VOC.		Turbines and duct burners	15.21	natural gas	228	mw		Particulate matter, filterable (FPM)	good combustion practiced and pipeline quality natural gas	0.005	LB/MMBTU	1 H

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA ENERGY CENTER, LLC	PA		12/23/2015	This plan approval is for the construction and temporary operation of three (3) identical General Electric Model 7HA.02 natural gas fired combustion turbines and heat recovery steam generator with duct burners (CT/HRSG). Each CT/HRSG combined-cycle process block includes one (1) combustion gas turbine and one (1) heat recovery steam generator with duct burners with all three (3) CT/HRSG sharing one (1) steam turbine. The entire power block is rated at 1,500 MW. Additional equipment includes: one (1) 2,000 kW diesel-fired emergency generator one (1) 315 HP diesel-fired emergency fire water pump one (1) 184.8 MM BTU/hr natural gas fired boiler one (1) 12 MMBTU/hr natural gas fuel gas heater two (2) Diesel fuel storage tanks four (4) lubricating oil tanks one (1) aqueous ammonia storage tank		Combustion turbine with duct burner	15.21	Natural gas	3,304.3	MMBtu/hr	Limits are for each CCCT and yearly limits are for cumulative turbine and duct burner. Duct burner throughput is 637.9 MMBtu/hr.	Particulate matter, filterable (FPM)	Exclusive natural gas, high-efficiency inlet air filters and DLN	0.003	LB/MMBTU	
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA ENERGY CENTER, LLC	PA		12/23/2015	This plan approval is for the construction and temporary operation of three (3) identical General Electric Model 7HA.02 natural gas fired combustion turbines and heat recovery steam generator with duct burners (CT/HRSG). Each CT/HRSG combined-cycle process block includes one (1) combustion gas turbine and one (1) heat recovery steam generator with duct burners with all three (3) CT/HRSG sharing one (1) steam turbine. The entire power block is rated at 1,500 MW. Additional equipment includes: one (1) 2,000 kW diesel-fired emergency generator one (1) 315 HP diesel-fired emergency fire water pump one (1) 184.8 MM BTU/hr natural gas fired boiler one (1) 12 MMBTU/hr natural gas fuel gas heater two (2) Diesel fuel storage tanks four (4) lubricating oil tanks one (1) aqueous ammonia storage tank		Combustion turbine with duct burner	15.21	Natural gas	3,304.3	MMBtu/hr	Limits are for each CCCT and yearly limits are for cumulative turbine and duct burner. Duct burner throughput is 637.9 MMBtu/hr.	Particulate matter, total 10µ (TPM10)	Exclusive natural gas, high-efficiency inlet air filters and DLN	0.0059	LB/MMBTU	
LACKAWANNA ENERGY CTR/JESSUP	LACKAWANNA ENERGY CENTER, LLC	PA		12/23/2015	This plan approval is for the construction and temporary operation of three (3) identical General Electric Model 7HA.02 natural gas fired combustion turbines and heat recovery steam generator with duct burners (CT/HRSG). Each CT/HRSG combined-cycle process block includes one (1) combustion gas turbine and one (1) heat recovery steam generator with duct burners with all three (3) CT/HRSG sharing one (1) steam turbine. The entire power block is rated at 1,500 MW. Additional equipment includes: one (1) 2,000 kW diesel-fired emergency generator one (1) 315 HP diesel-fired emergency fire water pump one (1) 184.8 MM BTU/hr natural gas fired boiler one (1) 12 MMBTU/hr natural gas fuel gas heater two (2) Diesel fuel storage tanks four (4) lubricating oil tanks one (1) aqueous ammonia storage tank		Combustion turbine with duct burner	15.21	Natural gas	3,304.3	MMBtu/hr	Limits are for each CCCT and yearly limits are for cumulative turbine and duct burner. Duct burner throughput is 637.9 MMBtu/hr.	Particulate matter, total 2.5µ (TPM2.5)	Exclusive natural gas, high-efficiency inlet air filters and DLN	0.0059	LB/MMBTU	
CPV TOWANTIC, LLC	CPV TOWANTIC, LLC	CT	Andrew Bazinet	11/30/2015	805 MW Combined Cycle Power Plant		Combined Cycle Power Plant	15.21	Natural Gas	21,200,000	MMBtu/12 months		Particulate matter, total 2.5µ (TPM2.5)		9.73	LB/H	
CPV TOWANTIC, LLC	CPV TOWANTIC, LLC	CT	Andrew Bazinet	11/30/2015	805 MW Combined Cycle Plant		Combined Cycle Power Plant	15.21	Natural Gas	21,200,000	MMBtu/yr		Particulate matter, total 2.5µ (TPM2.5)		9.73	LB/H	
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST. HEAT RATE LIMITED TO 6,793 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR MATTAWOMAN TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS MATTAWOMAN PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Particulate matter, filterable (FPM)	USE OF PIPELINE-QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICE	8.9	LB/H	3-HOUR BLOCK AVERAGE (W/OUT DUCT FIRING)

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST. HEAT RATE LIMITED TO 6,793 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR MATTAWOMAN TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS MATTAWOMAN PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Particulate matter, total 10µ (TPM10)	USE OF PIPELINE QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICES	17.9	LB/H	W/OUT DUCT FIRING, AVG. OF 3 STACK TESTS
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST. HEAT RATE LIMITED TO 6,793 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR MATTAWOMAN TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS MATTAWOMAN PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Particulate matter, total 2.5µ (TPM2.5)	USE OF PIPELINE QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICES.	17.9	LB/H	W/OUT DUCT FIRING, AVG. OF 3 STACK TESTS
FGE EAGLE PINES PROJECT	FGE EAGLE PINES, LLC	TX	Emerson Farrell	11/4/2015	The FGEEP Project will include three natural gas-fired combined cycle (NGCC) power blocks, each block comprised of two gas-fired combustion turbines, two supplemental fired duct burners (DBs) heat recovery steam generators (HRSGs), and one steam turbine. FGEEP selected Alstom GT36 combustion turbines (CTs), each nominally rated at 321 megawatts (MW). Each HRSG is equipped with DBs that will have a maximum design heat input capacity of 799 million British thermal units per hour (MMBtu/hr). The CTs and DBs are fueled with pipeline quality natural gas. Each power block will also have a steam turbine generator designed to produce approximately 502 MW with the additional duct firing. Each of the three blocks will include the following ancillary equipment: one multi-cell condenser/cooling tower, one emergency generator, one firewater pump, two diesel storage tanks, and pressurized aqueous ammonia storage tanks.		Combined Cycle Turbines (>25 MW)	15.21	natural gas	321	MW	Alstom GT36 combustion turbines (321 MW)+ 799 million British thermal units per hour (MMBtu/hr) duct burner	Particulate matter, total 10µ (TPM10)		21.4	LB/H	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
FGE EAGLE PINES PROJECT	FGE EAGLE PINES, LLC	TX	Emerson Farrell	11/4/2015	The FGEEP Project will include three natural gas-fired combined cycle (NGCC) power blocks, each block comprised of two gas-fired combustion turbines, two supplemental fired duct burners (DBs) heat recovery steam generators (HRSGs), and one steam turbine. FGEEP selected Alstom GT36 combustion turbines (CTs), each nominally rated at 321 megawatts (MW). Each HRSG is equipped with DBs that will have a maximum design heat input capacity of 799 million British thermal units per hour (MMBtu/hr). The CTs and DBs are fueled with pipeline quality natural gas. Each power block will also have a steam turbine generator designed to produce approximately 502 MW with the additional duct firing. Each of the three blocks will include the following ancillary equipment: one multi-cell condenser/cooling tower, one emergency generator, one firewater pump, two diesel storage tanks, and pressurized aqueous ammonia storage tanks.		Combined Cycle Turbines (>25 MW)	15.21	natural gas	321	MW	Alstom GT36 combustion turbines (321 MW)+ 799 million British thermal units per hour (MMBtu/hr) duct burner	Particulate matter, total 2.5µ (TPM2.5)		21.4	LB/H	
LON C. HILL POWER STATION	LON C. HILL, L.P.	TX	Matthew Lindsey	10/2/2015	The Lon C. Hill Power Station (LCHP) will include two natural gas-fired combined cycle combustion turbines (CTGs) equipped with dry low NOx burners (DLNs), heat recovery steam generators (HRSG), and natural gas-fired duct burners (DBs). Ancillary equipment includes evaporative coolers or inlet chillers, a single steam turbine (ST), auxiliary boiler, emergency generator, firewater pump, two cooling towers, oil water separator, degreaser, two diesel storage tanks, gasoline storage tank, selective catalytic reduction (SCR) and ammonia (NH3) handling systems including an NH3 storage tank, and two water tanks. The LCHP will be a 2x1 combined cycle power plant consisting of two CTGs, two HRSGs and one ST. The CTGs and ST will be one of two options: two Siemens SCC6-5000 CTGs and a SST6-5000 ST, or two General Electric 7FA CTGs and a D-11 ST.		Combined Cycle Turbines (>25 MW)	15.21	natural gas	195	MW	Two power configuration options authorized Siemens" 240 MW + 250 million British thermal units per hour (MMBtu/hr) duct burner GE" 195 MW + 670 MMBtu/hr duct burner	Particulate matter, total 10µ (TPM10)	Good combustion practices and use of pipeline quality natural gas	16	LB/HR	
LON C. HILL POWER STATION	LON C. HILL, L.P.	TX	Matthew Lindsey	10/2/2015	The Lon C. Hill Power Station (LCHP) will include two natural gas-fired combined cycle combustion turbines (CTGs) equipped with dry low NOx burners (DLNs), heat recovery steam generators (HRSG), and natural gas-fired duct burners (DBs). Ancillary equipment includes evaporative coolers or inlet chillers, a single steam turbine (ST), auxiliary boiler, emergency generator, firewater pump, two cooling towers, oil water separator, degreaser, two diesel storage tanks, gasoline storage tank, selective catalytic reduction (SCR) and ammonia (NH3) handling systems including an NH3 storage tank, and two water tanks. The LCHP will be a 2x1 combined cycle power plant consisting of two CTGs, two HRSGs and one ST. The CTGs and ST will be one of two options: two Siemens SCC6-5000 CTGs and a SST6-5000 ST, or two General Electric 7FA CTGs and a D-11 ST.		Combined Cycle Turbines (>25 MW)	15.21	natural gas	195	MW	Two power configuration options authorized Siemens" 240 MW + 250 million British thermal units per hour (MMBtu/hr) duct burner GE" 195 MW + 670 MMBtu/hr duct burner	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and use of pipeline quality natural gas	16	LB/HR	
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine With Duct Burner	15.21	Natural Gas	3,727	MMBtu/hr	DLN burner, SCR, Oxidation Catalyst and shall maintain and operate the sources and associated air cleaning devices in accordance with good engineering practice. shall install, certify, maintain and operate continuous emission monitoring systems (CEMS) for nitrogen oxides, carbon monoxide, carbon dioxide, and ammonia emissions on the exhaust of each combined-cycle powerblock. Emissions limits are for each combustion turbine/duct burner block.	Particulate matter, total (TPM)		0.0063	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine With Duct Burner	15.21	Natural Gas	3,727	MMBtu/hr	DLN burner, SCR, Oxidation Catalyst and shall maintain and operate the sources and associated air cleaning devices in accordance with good engineering practice. shall install, certify, maintain and operate continuous emission monitoring systems (CEMS) for nitrogen oxides, carbon monoxide, carbon dioxide, and ammonia emissions on the exhaust of each combined-cycle powerblock. Emissions limits are for each combustion turbine/duct burner block.	Particulate matter, total 10µ (TPM10)		0.0063	LB/MMBTU	
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine With Duct Burner	15.21	Natural Gas	3,727	MMBtu/hr	DLN burner, SCR, Oxidation Catalyst and shall maintain and operate the sources and associated air cleaning devices in accordance with good engineering practice. shall install, certify, maintain and operate continuous emission monitoring systems (CEMS) for nitrogen oxides, carbon monoxide, carbon dioxide, and ammonia emissions on the exhaust of each combined-cycle powerblock. Emissions limits are for each combustion turbine/duct burner block.	Particulate matter, total 2.5µ (TPM2.5)		0.0063	LB/MMBTU	
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine without Duct Burner	15.21					Particulate matter, total (TPM)		0.0063	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine without Duct Burner	15.21					Particulate matter, total 10µ (TPM10)		0.0063	LB/MMBTU	
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine without Duct Burner	15.21					Particulate matter, total 2.5µ (TPM2.5)		0.0063	LB/MMBTU	
THE EMPIRE DISTRICT ELECTRIC COMPANY	THE EMPIRE DISTRICT ELECTRIC COMPANY	KS	Jeff Burkett	7/14/2015	The Empire District Electric Company" Riverton Plant (EDEC) (Source ID: 0210002) is a fossil fuel electricity generation facility located in Cherokee County, Kansas.	This PSD permit with tracking number C-12987 is a modification of PSD permits C-12670 (Administrative Amendment, issued on 2/19/2015) and C-10913 (original PSD Permit for the proposed project, issued on 7/11/2013).	Combined cycle combustion turbine	15.21	Natural gas	250	MW	Combined cycle combustion unit; this unit includes a heat recovery steam generator (HRSG) with supplemental natural gas duct firing (duct burners) and a condensing steam turbine generator with SCR and CO catalyst.	Particulate matter, total 2.5µ (TPM2.5)	dry low NOx burners heat recovery steam generator (HRSG)	30.2	LB/H	
THE EMPIRE DISTRICT ELECTRIC COMPANY	THE EMPIRE DISTRICT ELECTRIC COMPANY	KS	Jeff Burkett	7/14/2015	The Empire District Electric Company" Riverton Plant (EDEC) (Source ID: 0210002) is a fossil fuel electricity generation facility located in Cherokee County, Kansas.	This PSD permit with tracking number C-12987 is a modification of PSD permits C-12670 (Administrative Amendment, issued on 2/19/2015) and C-10913 (original PSD Permit for the proposed project, issued on 7/11/2013).	Combined cycle combustion turbine	15.21	Natural gas	250	MW	Combined cycle combustion unit; this unit includes a heat recovery steam generator (HRSG) with supplemental natural gas duct firing (duct burners) and a condensing steam turbine generator with SCR and CO catalyst.	Particulate matter, total 10µ (TPM10)	dry low NOx burners heat recovery steam generator (HRSG)	30.2	LB/H	
THE EMPIRE DISTRICT ELECTRIC COMPANY	THE EMPIRE DISTRICT ELECTRIC COMPANY	KS	Jeff Burkett	7/14/2015	The Empire District Electric Company" Riverton Plant (EDEC) (Source ID: 0210002) is a fossil fuel electricity generation facility located in Cherokee County, Kansas.	This PSD permit with tracking number C-12987 is a modification of PSD permits C-12670 (Administrative Amendment, issued on 2/19/2015) and C-10913 (original PSD Permit for the proposed project, issued on 7/11/2013).	Combined cycle combustion turbine	15.21	Natural gas	250	MW	Combined cycle combustion unit; this unit includes a heat recovery steam generator (HRSG) with supplemental natural gas duct firing (duct burners) and a condensing steam turbine generator with SCR and CO catalyst.	Particulate matter, total (TPM)	dry low NOx burners heat recovery steam generator (HRSG)	30.2	LB/H	
EAGLE MOUNTAIN STEAM ELECTRIC STATION	EAGLE MOUNTAIN POWER COMPANY LLC	TX	Paul Coon	6/18/2015	Eagle is proposing to construct two new combined cycle combustion turbines (CTG) which will generate electric power for sale on the wholesale electric market. The ancillary equipment includes an auxiliary boiler, a firewater pump, an emergency generator, a steam turbine, and various support facilities.		Combined Cycle Turbines (>25 MW)" natural gas	15.21	natural gas	210	MW	Two power configuration options authorized Siemens" 231 MW + 500 million British thermal units per hour (MMBtu/hr) duct burner GE" 210 MW + 349.2 MMBtu/hr duct burner	Particulate matter, total 10µ (TPM10)		35.47	LB/H	
EAGLE MOUNTAIN STEAM ELECTRIC STATION	EAGLE MOUNTAIN POWER COMPANY LLC	TX	Paul Coon	6/18/2015	Eagle is proposing to construct two new combined cycle combustion turbines (CTG) which will generate electric power for sale on the wholesale electric market. The ancillary equipment includes an auxiliary boiler, a firewater pump, an emergency generator, a steam turbine, and various support facilities.		Combined Cycle Turbines (>25 MW)" natural gas	15.21	natural gas	210	MW	Two power configuration options authorized Siemens" 231 MW + 500 million British thermal units per hour (MMBtu/hr) duct burner GE" 210 MW + 349.2 MMBtu/hr duct burner	Particulate matter, total 2.5µ (TPM2.5)		35.47	LB/H	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SHELL CHEM APPALACHIA/PETROCHEMICALS COMPLEX	SHELL CHEMICAL APPALACHIA	PA		6/18/2015	The plan approval will allow the construction and temporary operation of seven (7) 620 MMBtu/hr ethane cracking furnaces fired primarily by tail gas and natural gas for the production of approximately 1.5 million metric tons/year of polyethylene. Byproducts from the ethylene production include coke residue/tar, light gasoline, pyrolysis fuel oil, and a C3+ mixture and will be remove from the site for disposal or use as appropriate. Additional facilities include an electric and steam cogeneration from three (3) combustion turbines with duct burners and heat recovery steam generators with a plant capacity of 250.4 MW, four (4) emergency generators, three (3) diesel-fired fire pump engines, cooling towers, flares, and storage tanks.	(7) 620.000 MMBtu/hr Ethane cracking furnaces, (3) 664.000 combustion turbines with duct burners. Shell intends to convert ethane in to ethylene for manufacturing of various grades of low density and high density polyethylene as a final product.	Combustion turbine wih duct burner and heat recovery steam generator	15.21	Natural Gas		Three 40.6 MW turbines	Three (3) General Electric Frame 6B NG fired turbine with duct burners and heat recovery steam generators. Total electric generating capacity will be 250.4 MW from cogeneration three turbines at 40.6 MW and two HRSG at 64.3 MW. Excess electricity generated will be sold to the grid in quantities sufficient to classify the facility as an electric utility.	Particulate matter, total 10µ (TPM10)		0.0066	LB/MMBTU	
SHELL CHEM APPALACHIA/PETROCHEMICALS COMPLEX	SHELL CHEMICAL APPALACHIA	PA		6/18/2015	The plan approval will allow the construction and temporary operation of seven (7) 620 MMBtu/hr ethane cracking furnaces fired primarily by tail gas and natural gas for the production of approximately 1.5 million metric tons/year of polyethylene. Byproducts from the ethylene production include coke residue/tar, light gasoline, pyrolysis fuel oil, and a C3+ mixture and will be remove from the site for disposal or use as appropriate. Additional facilities include an electric and steam cogeneration from three (3) combustion turbines with duct burners and heat recovery steam generators with a plant capacity of 250.4 MW, four (4) emergency generators, three (3) diesel-fired fire pump engines, cooling towers, flares, and storage tanks.	(7) 620.000 MMBtu/hr Ethane cracking furnaces, (3) 664.000 combustion turbines with duct burners. Shell intends to convert ethane in to ethylene for manufacturing of various grades of low density and high density polyethylene as a final product.	Combustion turbine wih duct burner and heat recovery steam generator	15.21	Natural Gas		Three 40.6 MW turbines	Three (3) General Electric Frame 6B NG fired turbine with duct burners and heat recovery steam generators. Total electric generating capacity will be 250.4 MW from cogeneration three turbines at 40.6 MW and two HRSG at 64.3 MW. Excess electricity generated will be sold to the grid in quantities sufficient to classify the facility as an electric utility.	Particulate matter, total 2.5µ (TPM2.5)		0.0066	LB/MMBTU	
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two combined cycle turbines with out duct burner	15.21	Natural Gas	2,291.64	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode, the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. (Operational limits are for each CCCT NG-fired without duct burner)	Particulate matter, total (TPM)	Good combustion practices and low sulfur fuels	0.0068	LB/MMBTU	
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two combined cycle turbines with out duct burner	15.21	Natural Gas	2,291.64	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode, the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. (Operational limits are for each CCCT NG-fired without duct burner)	Particulate matter, total 10µ (TPM10)	Good combustion practices and low sulfur fuels	0.0068	LB/MMBTU	
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two combined cycle turbines with out duct burner	15.21	Natural Gas	2,291.64	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode, the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. (Operational limits are for each CCCT NG-fired without duct burner)	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and low sulfur fuels	0.0068	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two Combine Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	3,001.57	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. . (Operational limits are for each CCCT NG-fired with duct burner)	Particulate matter, total (TPM)	Good combustion practices and low sulfur fuels	0.0066	LB/MMBTU	
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two Combine Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	3,001.57	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. . (Operational limits are for each CCCT NG-fired with duct burner)	Particulate matter, total 10µ (TPM10)	Good combustion practices and low sulfur fuels	0.0066	LB/MMBTU	
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two Combine Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	3,001.57	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. . (Operational limits are for each CCCT NG-fired with duct burner)	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and low sulfur fuels	0.0066	LB/MMBTU	
CASH CREEK GENERATING STATION	CASH CREEK GENERATION, L.L.C	KY	Mike Mcinnus	6/10/2015	natural gas fired combined cycle power plant		Combined cycle combustion turbine with HRSG and duct firing	15.21	Natural gas pipeline quality	849	MW	Two CT with HRSGs with duct burner Max fuel input for CTs and HRSGs 6,714 mmBtu/hr HHV Max Gross output 849 MW at 0F	Particulate matter, total 10µ (TPM10)	Combust only pipeline quality natural gas	0.0088	LB.MMBTU	THREE(3) HOUR ROLLING AVERAGE
CASH CREEK GENERATING STATION	CASH CREEK GENERATION, L.L.C	KY	Mike Mcinnus	6/10/2015	natural gas fired combined cycle power plant		Combined cycle combustion turbine with HRSG and duct firing	15.21	Natural gas pipeline quality	849	MW	Two CT with HRSGs with duct burner Max fuel input for CTs and HRSGs 6,714 mmBtu/hr HHV Max Gross output 849 MW at 0F	Particulate matter, total 2.5µ (TPM2.5)	Combust pipeline quality natural gas only	0.0088	LB/MMBTU	THREE HOUR ROLLING AVERAGE
CASH CREEK GENERATING STATION	CASH CREEK GENERATION, L.L.C	KY	Mike Mcinnus	6/10/2015	natural gas fired combined cycle power plant		Combined cycle combustion turbine with HRSG and duct firing	15.21	Natural gas pipeline quality	849	MW	Two CT with HRSGs with duct burner Max fuel input for CTs and HRSGs 6,714 mmBtu/hr HHV Max Gross output 849 MW at 0F	Particulate matter, total (TPM)	Combust only pipeline quality natural gas	0.0088	LB.MMBTU	THREE HOUR ROLLING AVERAGE

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
COLORADO BEND ENERGY CENTER	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Particulate matter, total (TPM)	efficient combustion, natural gas fuel	43	LB/H	
COLORADO BEND ENERGY CENTER	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Particulate matter, total 10µ (TPM10)	efficient combustion, natural gas fuel	43	LB/H	
COLORADO BEND ENERGY CENTER	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Particulate matter, total 2.5µ (TPM2.5)	efficient combustion, natural gas fuel	43	LB/H	
S R BERTRON ELECTRIC GENERATING STATION	NRG TEXAS POWER LLC	TX	Craig Eckberg	12/19/2014	NRG Texas is proposing to construct an additional electric power generation station at the Bertron Power Project which will generate electric power for sale on the wholesale electric market. The Bertron Power Project will include two power blocks that can be operated in combined cycle mode.		(2) combined cycle turbines	15.21	natural gas	240	MW	The gas turbines will be one of three options: (1) Two Siemens Model F5 (SF5) CTGs each rated at nominal capability of 225 megawatts (MW). Each CTG will have a duct fired HRSG with a maximum heat input of 688 million British thermal units per hour (MMBtu/hr). (2) Two General Electric Model 7FA (GE7FA) CTGs each rated at nominal capability of 215 MW. Each CTG will have a duct fired HRSG with a maximum heat input of 523 MMBtu/hr. (3) Two Mitsubishi Heavy Industry G Frame (MHI501G) CTGs each rated at a nominal electric output of 263 MW. Each CTG will have a duct fired HRSG with a maximum heat input of 686 MMBtu/hr.	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
VICTORIA POWER STATION	VICTORIA WLE L.P.	TX	Gary Clark	12/1/2014	The facility is currently authorized under Standard Permit No. 80878 and several Permits by Rule (PBR), including§106.263 for maintenance, startup, and shutdown (MSS) (PBR Registration No. 94387) and Title V Permit No. O-35. Victoria proposes to install an additional natural gas-fired turbine (GT) and HRSG with duct burners at the Victoria Station. The resulting new facility will be a combined cycle generating facility in a 2x2x1 configuration (two combustion turbines, two HRSGs with duct burners, and one steam turbine).		combined cycle turbine	15.21	natural gas	197	MW	General Electric 7FA.04 at 197 MW nominal output. The duct burners will be capable of a maximum natural gas firing rate of up to 483 MMBtu/hr (HHV). The duct burners may be fired additional hours; however, total annual firing will not exceed the equivalent of 4,375 hours at maximum capacity per duct burner. The available capacity of the existing steam turbine will be increased from 125 MW in its existing 1x1x1 configuration to approximately 185 MW in the 2x2x1 configuration.	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MOUNDSVILLE POWER, LLC	WV	Jon Williams	11/21/2014	Nominal 549 mW(output) natural gas-fired combined cycle power plant.		Combined Cycle Turbine/Duct Burner	15.21	Natural Gas	2,419.61	mmBtu/Hr	This entry is for both of two identical units at the facility. Nominal 197 mW General Electric Frame 7FA.04 Turbine w/ Duct Burner - throughput denotes aggregate heat input of turbine and duct burner (HHV).	Particulate matter, total 2.5µ (TPM2.5)	Good Combustion Practices, Inlet Air Filtration, & use of Natural Gas	8.9	LB/H	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
TRINIDAD GENERATING FACILITY	SOUTHERN POWER COMPANY	TX	Kelli Mccullough	11/20/2014	Southern Power Company (SPC) is proposing to construct an electric generating facility near Trinidad, Henderson County, Texas. The Trinidad Generating Facility (TGF) will include a natural gas-fired combined cycle combustion turbine generator (CTG) equipped with heat recovery steam generator (HRSG) and duct burners (DB).		combined cycle turbine	15.21	natural gas	497	MW	The facility will consist of a Mitsubishi Heavy Industries (MHI) J model gas fired combustion turbine nominally rated at 497 megawatts (MW) equipped with a HRSG and DB with a maximum design capacity of 402 million British thermal units per hour (MMBtu/hr). The gross nominal output of the CTG with HRSG and DB is 530 MW.	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS. HEAT INPUT LIMITED TO 6,802 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR KEYS TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS KEYS PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Particulate matter, filterable (FPM)	USE OF PIPELINE-QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICE	8.8	LB/H	3-HOUR BLOCK AVERAGE, W/OUT DUCT FIRING
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS. HEAT INPUT LIMITED TO 6,802 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR KEYS TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS KEYS PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Particulate matter, total 10µ (TPM10)	USE OF PIPELINE-QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICES.	11	LB/H	W/OUT DUCT FIRING, AVG. OF 3 STACK TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CEDAR BAYOU ELECTRIC GENERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	8/29/2014	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the combined cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The new units will produce between 215-263 MW each.		Combined cycle natural gas turbines	15.21	Natural Gas	225	MW		Particulate matter, filterable 2.5µ (FPM2.5)	Good combustion practices, natural gas			
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine without Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burner.	Particulate matter, filterable (FPM)	Use of natural gas a clean burning fuel	6	LB/H	AVERAGE OF THREE ONE HOUR STACK TESTS
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine without Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burner.	Particulate matter, total 10µ (TPM10)	Use of natural gas a clean burning fuel	10	LB/H	AVERAGE OF THREE ONE HOUR STACK TESTS
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine without Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burner.	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas a clean burning fuel	10	LB/H	AVERAGE OF THREE ONE HOUR STACK TESTS
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burners.	Particulate matter, filterable (FPM)	Use of Natural gas a clean burning fuel	15.1	LB/H	AVERAGE OF THREE STACK TEST RUNS
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burners.	Particulate matter, total 10µ (TPM10)	Use of Natural gas a clean burning fuel	21.55	LB/H	AVERAGE OF THREE STACK TEST RUNS
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMbtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMbtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burners.	Particulate matter, total 2.5µ (TPM2.5)	Use of Natural Gas a clean burning fuel	21.55	LB/H	AVERAGE OF THREE STACK TEST RUNS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
FREEPORT LNG PRETREATMENT FACILITY	FREEPORT LNG DEVELOPMENT LP	TX	Ruben Velasquez	7/16/2014	In support of the proposed Liquefaction Plant pending TCEQ review under Air Quality Permit Nos. 100114, PSDTX1282, and N150, Freeport LNG plans to construct a natural gas Pretreatment Facility to purify pipeline quality natural gas to be sent to the Liquefaction Plant for the production of LNG. The Pretreatment Facility will be located approximately 3.5 miles inland to the northeast of the Quintana Island Terminal along Freeport LNGs existing 42-inch natural gas pipeline route. Pipeline quality natural gas will be delivered from interconnecting intrastate pipeline systems through Freeport LNG Developments existing Stratton Ridge meter station. The gas will be pretreated in the Pretreatment Facility to remove carbon dioxide, sulfur compounds, water, mercury, BTEX, and natural gas liquids. The pre-treated natural gas will then be delivered to the Liquefaction Plant through Freeport LNGs existing 42-inch gas pipeline.		Combustion Turbine	15.21	natural gas	87	MW	The exhaust heat from the turbine will be used to heat a heating medium which is used to regenerate rich amine from the acid gas removal system.	Particulate matter, total 2.5µ (TPM2.5)		15.22	LB/H	
COVE POINT LNG TERMINAL	DOMINION COVE POINT LNG, LP	MD	Richard B. Gangle	6/9/2014	LIQUIFIED NATURAL GAS PROCESSING FACILITY AND 130 MEGAWATT GENERATING STATIONFACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	2 COMBUSTION TURBINES	15.21	NATURAL GAS	130	MW	TWO GENERAL ELECTRIC (GE) FRAME 7EA COMBUSTION TURBINES (CTS) WITH A NOMINAL NET 87.2 MEGAWATT (MW) RATED CAPACITY, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), EQUIPPED WITH DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR), AND OXIDATION CATALYST	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF FACILITY PROCESS FUEL GAS OR PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.0033	LB/MMBTU	3-HOUR BLOCK AVERAGE
COVE POINT LNG TERMINAL	DOMINION COVE POINT LNG, LP	MD	Richard B. Gangle	6/9/2014	LIQUIFIED NATURAL GAS PROCESSING FACILITY AND 130 MEGAWATT GENERATING STATIONFACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	2 COMBUSTION TURBINES	15.21	NATURAL GAS	130	MW	TWO GENERAL ELECTRIC (GE) FRAME 7EA COMBUSTION TURBINES (CTS) WITH A NOMINAL NET 87.2 MEGAWATT (MW) RATED CAPACITY, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), EQUIPPED WITH DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR), AND OXIDATION CATALYST	Particulate matter, total 10µ (TPM10)	EXCLUSIVE USE OF FACILITY PROCESS FUEL GAS OR PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.007	LB/MMBTU	3 STACK TEST RUN AVERAGE, EXCEPT SU/SD
COVE POINT LNG TERMINAL	DOMINION COVE POINT LNG, LP	MD	Richard B. Gangle	6/9/2014	LIQUIFIED NATURAL GAS PROCESSING FACILITY AND 130 MEGAWATT GENERATING STATIONFACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	2 COMBUSTION TURBINES	15.21	NATURAL GAS	130	MW	TWO GENERAL ELECTRIC (GE) FRAME 7EA COMBUSTION TURBINES (CTS) WITH A NOMINAL NET 87.2 MEGAWATT (MW) RATED CAPACITY, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), EQUIPPED WITH DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR), AND OXIDATION CATALYST	Particulate matter, total 2.5µ (TPM2.5)	EXCLUSIVE USE OF FACILITY PROCESS FUEL GAS OR PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES	0.007	LB/MMBTU	3 STACK TEST RUN AVERAGE, EXCEPT SU/SD
TENASKA BROWNSVILLE GENERATING STATION	TENASKA BROWNSVILLE PARTNERS, LLC	TX	Larry Carlson	4/29/2014	Tenaska proposes a new electric power plant, using combined cycle gas turbine (CCGT) technology and fueled by pipeline quality natural gas. The proposed permit authorizes two CTs (2x1 CCGT), although the final design selected by Tenaska may only consist of one CT (1x1 CCGT).		(2) combined cycle turbines	15.21	natural gas	274	MW	Each CTG is site-rated at 274 MW gross electric output at 62°F ambient temperature. At this condition, two HRSGs with full duct burner firing produce enough steam to generate an additional 336 MW, for a total of 884 MW gross, or with about 5% losses, about 840 MW net electric output. Under summertime conditions, the net output is approximately 800 MW with the 2x1 CCGT configuration or about 400 MW with the 1x1 CCGT configuration.	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
CPV ST. CHARLES	CPV MARYLAND, LLC	MD	Donald Atwood	4/23/2014	725 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT 100.0 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/YR	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	725	MEGAWATT	TWO GENERAL ELECTRIC (GE) F-CLASS ADVANCED COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 725 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Particulate matter, filterable (FPM)	USE OF PIPELINE-QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICE	0.008	LB/MMBTU	3-HOUR BLOCK AVERAGE
CPV ST. CHARLES	CPV MARYLAND, LLC	MD	Donald Atwood	4/23/2014	725 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT 100.0 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/YR	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	725	MEGAWATT	TWO GENERAL ELECTRIC (GE) F-CLASS ADVANCED COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 725 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Particulate matter, total 10µ (TPM10)	USE OF PIPELINE-QUALITY NATURAL GAS EXCLUSIVELY AND GOOD COMBUSTION PRACTICE	0.005	LB/MMBTU	AVERAGE OF THREE STACK TEST RUNS
MARSHALLTOWN GENERATING STATION	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #1 - combined cycle	15.21	natural gas	2,258	mmBtu/hr	two identical Siemens SGT6-5000F combined cycle turbines without duct firing, each at 2258 mmBtu/hr generating approx. 300 MW each.	Particulate matter, total (TPM)		0.01	LB/MMBTU	AVG. OF 3 ONE HOUR TEST RUNS
MARSHALLTOWN GENERATING STATION	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #2 -combined cycle	15.21	natural gas	2,258	mmBtu/hr		Particulate matter, total (TPM)		0.01	LB/MMBTU	AVERAGE OF 3 ONE-HOUR TEST RUNS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITH DUCT FIRING	15.21	NATURAL GAS	1,000	MW	TWO MITSUBISHI G MODEL COMBUSTION TURBINE GENERATORS (CTS) WITH A NOMINAL GENERATING CAPACITY OF 270 MW CAPACITY EACH, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR), OXIDATION CATALYST	Particulate matter, filterable (FPM)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	22.8	LB/H	3-HOUR BLOCK AVERAGE
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITH DUCT FIRING	15.21	NATURAL GAS	1,000	MW	TWO MITSUBISHI G MODEL COMBUSTION TURBINE GENERATORS (CTS) WITH A NOMINAL GENERATING CAPACITY OF 270 MW CAPACITY EACH, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR), OXIDATION CATALYST	Particulate matter, total 10µ (TPM10)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	38	LB/H	AVERAGE OF 3 STACK TEST RUNS
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITH DUCT FIRING	15.21	NATURAL GAS	1,000	MW	TWO MITSUBISHI G MODEL COMBUSTION TURBINE GENERATORS (CTS) WITH A NOMINAL GENERATING CAPACITY OF 270 MW CAPACITY EACH, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR), OXIDATION CATALYST	Particulate matter, total 2.5µ (TPM2.5)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	38	LB/H	AVERAGE OF 3 STACK TEST RUNS
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITHOUT DUCT FIRING	15.21	NATURAL GAS	270	MW		Particulate matter, filterable (FPM)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	15	LB/H	3-HOUR BLOCK AVERAGE
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITHOUT DUCT FIRING	15.21	NATURAL GAS	270	MW		Particulate matter, total 10µ (TPM10)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	25.1	LB/H	AVERAGE OF 3 STACK TEST RUNS
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITHOUT DUCT FIRING	15.21	NATURAL GAS	270	MW		Particulate matter, total 2.5µ (TPM2.5)	EXCLUSIVE USE OF PIPELINE QUALITY NATURAL GAS AND EFFICIENT TURBINE DESIGN	25.1	LB/H	AVERAGE OF 3 STACK TEST RUNS
FGE TEXAS POWER I AND FGE TEXAS POWER II	FGE POWER LLC	TX	Emerson Farrell	3/24/2014	Electric Generating Utility	TCEQ Permit No. 110025	Alstom Turbine	15.21	Natural Gas	230.7	MW	Four (4) Alstom GT24 CTGs, each with a HRSG and DBs, max design capacity 409 MMBtu/hr	Particulate matter, total 2.5µ (TPM2.5)	Low sulfur fuel, good combustion practices	2	PPMVD	
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	Combined Cycle Combustion Turbine - Siemens turbine without Duct Burner	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each Siemens combustion turbine will be 2,356 MMBtu/hr(HHV)	Particulate matter, filterable (FPM)	Use of Natural Gas as a clean burning fuel	10.5	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	Combined Cycle Combustion Turbine - Siemens turbine without Duct Burner	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each Siemens combustion turbine will be 2,356 MMBtu/hr(HHV)	Particulate matter, total 10µ (TPM10)	USE OF NATURAL GAS A CLEAN BURNING FUEL	13	LB/H	AVERAGE OF THREE ONE HOUR TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	Combined Cycle Combustion Turbine - Siemens turbine without Duct Burner	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each Siemens combustion turbine will be 2,356 MMBtu/hr(HHV)	Particulate matter, total 2.5µ (TPM2.5)	USE OF NATURAL GAS A CLEAN BURNING FUEL	13	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - SIEMENS	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two Siemens turbines and two associated duct burners) The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV).	Particulate matter, filterable (FPM)	Use of natural gas a clean burning fuel	10.6	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - SIEMENS	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two Siemens turbines and two associated duct burners) The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV).	Particulate matter, total 10µ (TPM10)	Use of natural gas a clean burning fuel	14	LB/H	AVERAGE OF THREE TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - SIEMENS	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two Siemens turbines and two duct burners) The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV).	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas a clean burning fuel	14	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - GENERAL ELECTRIC	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion each turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 MMBtu/hr duct burner	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas only as a clean burning fuel	14.6	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - GENERAL ELECTRIC	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion each turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 MMBtu/hr duct burner	Particulate matter, total 10µ (TPM10)	Use of natural gas only as a clean burning fuel	14.6	LB/H	AVERAGE OF THREE ONE HOUR TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - GENERAL ELECTRIC	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion each turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 MMBtu/hr duct burner	Particulate matter, filterable 2.5µ (FPM2.5)	Use of Natural Gas a clean burning fuel	9.8	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITHOUT DUCT BURNER - GENERAL ELECTRIC	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion turbine will be 2,312 MMBtu/hr(HHV)	Particulate matter, filterable (FPM)	Use of Natural Gas as a clean burning fuel	8.7	LB/H	AVERAGE OF THREE ONE-HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITHOUT DUCT BURNER - GENERAL ELECTRIC	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion turbine will be 2,312 MMBtu/hr(HHV)	Particulate matter, total 10µ (TPM10)	Use of Natural Gas as a clean burning fuel	12.7	LB/H	AVERAGE OF THREE ONE HOUR TESTS
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITHOUT DUCT BURNER - GENERAL ELECTRIC	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion turbine will be 2,312 MMBtu/hr(HHV)	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas as a clean burning fuel	12.7	LB/H	AVERAGE OF THREE ONE-HOUR TESTS
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	FUTURE POWER PA INC	PA	James Palumbo	3/4/2014	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 346 MW nominal, using a combustion turbine generator and a heat recovery steam generator that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The Turbine is rated at 2,267 MMBTU/hr HHV (2,042 MMBTU/hr LHV). The Duct burner is rated at 134.3 MMBTU/hr HHV (120 MMBTU/hr LHV). The proposed project will also include a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other plant equipment.		Turbine, COMBINED CYCLE UNIT (Siemens 5000)	15.21	Natural Gas	2,267	MMBTU/H		Particulate matter, filterable (FPM)		10.4	LB/H	WITH DUCT BURNER
FUTURE POWER PA/GOOD SPRINGS NGCC FACILITY	FUTURE POWER PA INC	PA	James Palumbo	3/4/2014	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 346 MW nominal, using a combustion turbine generator and a heat recovery steam generator that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The Turbine is rated at 2,267 MMBTU/hr HHV (2,042 MMBTU/hr LHV). The Duct burner is rated at 134.3 MMBTU/hr HHV (120 MMBTU/hr LHV). The proposed project will also include a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other plant equipment.		Turbine, COMBINED CYCLE UNIT (Siemens 5000)	15.21	Natural Gas	2,267	MMBTU/H		Particulate matter, total 10µ (TPM10)		15.6	LB/H	WITH DUCT BURNER

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SALEM HARBOR STATION REDEVELOPMENT	FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP	MA	Scott Silverstein	1/30/2014	Footprint Power Salem Harbor Development LP (the Permittee) proposes to construct and operate a nominal 630 Megawatt (MW) natural gas fired, quick start (capable of producing 300 MW within 10 minutes of startup) combined cycle electric generating facility (the Facility) at Salem Harbor Station. With duct firing, the proposed Facility will be capable of generating an additional 62 MW, for a total of 692 MW. Emission units include two 315 MW (nominal) GE Model 107F Series 5 combustion turbine generators, each with dedicated heat recovery steam generator, duct burner and 31 MW (estimated) steam turbine generator, dispatchable independently of one another by ISO-NE; one 80 mmBtu/hr auxiliary boiler, one 750 kW emergency engine-generator, and one 371 bhp emergency engine-fire-pump.	separate PSD permit under delegated program, and CPA approval (including nonattainment major NSR for NOx as ozone precursor, and state minor NSR for other pollutants) other facility-wide emission limits (not listed in next section): GHG(CO2e): 2,279,530 TPY CO2: 2,277,333 TPY H2SO4: 19.0 TPY	Combustion Turbine with Duct Burner	15.21	Natural Gas	2,449	MMBTU/H	two 315 MW (nominal) GE Energy 7F Series 5 Rapid Response Combined Cycle Combustion Turbines with Duct Burners and 31 MW (estimated) steam turbine generators	Particulate matter, total 10µ (TPM10)		0.0062	LB/MMBTU	1 HR AVG/DO NOT APPLY DURING SS
SALEM HARBOR STATION REDEVELOPMENT	FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP	MA	Scott Silverstein	1/30/2014	Footprint Power Salem Harbor Development LP (the Permittee) proposes to construct and operate a nominal 630 Megawatt (MW) natural gas fired, quick start (capable of producing 300 MW within 10 minutes of startup) combined cycle electric generating facility (the Facility) at Salem Harbor Station. With duct firing, the proposed Facility will be capable of generating an additional 62 MW, for a total of 692 MW. Emission units include two 315 MW (nominal) GE Model 107F Series 5 combustion turbine generators, each with dedicated heat recovery steam generator, duct burner and 31 MW (estimated) steam turbine generator, dispatchable independently of one another by ISO-NE; one 80 mmBtu/hr auxiliary boiler, one 750 kW emergency engine-generator, and one 371 bhp emergency engine-fire-pump.	separate PSD permit under delegated program, and CPA approval (including nonattainment major NSR for NOx as ozone precursor, and state minor NSR for other pollutants) other facility-wide emission limits (not listed in next section): GHG(CO2e): 2,279,530 TPY CO2: 2,277,333 TPY H2SO4: 19.0 TPY	Combustion Turbine with Duct Burner	15.21	Natural Gas	2,449	MMBTU/H	two 315 MW (nominal) GE Energy 7F Series 5 Rapid Response Combined Cycle Combustion Turbines with Duct Burners and 31 MW (estimated) steam turbine generators	Particulate matter, total 2.5µ (TPM2.5)		0.0062	LB/MMBTU	1 HR AVG/DO NOT APPLY DURING SS
BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	BERKS HOLLOW ENERGY ASSOC LLC	PA	Bradley J Cooley	12/17/2013	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	Turbine, Combined Cycle, #1 and #2	15.21	Natural Gas	3,046	MMBTU/H	Equipped with SCR and Oxidation Catalyst	Particulate matter, filterable 10µ (FPM10)		48.56	TPY	12-MONTH ROLLING TOTAL
BERKS HOLLOW ENERGY ASSOC LLC/ONTELAUNEE	BERKS HOLLOW ENERGY ASSOC LLC	PA	Bradley J Cooley	12/17/2013	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	Turbine, Combined Cycle, #1 and #2	15.21	Natural Gas	3,046	MMBTU/H	Equipped with SCR and Oxidation Catalyst	Particulate matter, total 2.5µ (TPM2.5)		48.56	TPY	12-MONTH ROLLING TOTAL
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct burners	15.21	natural gas	647	MMBTU/H for each CTGHRSG	This process is identified in the permit as FGCTGHRSG; it is 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSGs) equipped with duct burners for supplemental firing (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. Each CTGHRSG shall not exceed 647 MMBtu/hr on a fuel heat input basis.	Particulate matter, filterable (FPM)	Good combustion practices and the use of pipeline quality natural gas.	0.007	LB/MMBTU	TEST PROTOCOL
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct burners	15.21	natural gas	647	MMBTU/H for each CTGHRSG	This process is identified in the permit as FGCTGHRSG; it is 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSGs) equipped with duct burners for supplemental firing (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. Each CTGHRSG shall not exceed 647 MMBtu/hr on a fuel heat input basis.	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of pipeline quality natural gas.	0.014	LB/MMBTU	TEST PROTOCOL
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct burners	15.21	natural gas	647	MMBTU/H for each CTGHRSG	This process is identified in the permit as FGCTGHRSG; it is 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSGs) equipped with duct burners for supplemental firing (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. Each CTGHRSG shall not exceed 647 MMBtu/hr on a fuel heat input basis.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of pipeline quality natural gas.	0.014	LB/MMBTU	TEST PROTOCOL

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PINECREST ENERGY CENTER	PINECREST ENERGY CENTER LLC	TX	Kathleen Smith	11/12/2013	Combinec Cycle Electric Generating Plant	103839	combined cycle turbine	15.21	natural gas	700	MW	The generating equipment consists of two natural gas-fired combustion turbines (CTs), each exhausting to a fired heat recovery steam generator (HRSG) to produce steam to drive a shared steam turbine generator. The steam turbine is rated at 271 MW of electric output. Three models of combustion turbines are being considered for this site: the General Electric 7FA.05, the Siemens SGT6-5000F(4), and the Siemens SGT6-5000F(5). The final selection of the combustion turbine will not be made until after the permit is issued. Plant output will range between 637 and 735 MW, depending on the model turbine selected. Duct Burners are rated at 750 MMBtu/hr each.	Particulate matter, total 2.5µ (TPM2.5)	pipeline quality natural gas and good combustion practices	26.2	LB/H	
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Natural gas fueled combined cycle combustion turbine generators (CTG)	15.21	Natural gas	2,147	MMBTU/H	FG-CTG1-4: Four natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. Two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner, a selective catalytic reduction (SCR) system, and a catalytic oxidation system. The throughput capacity is 2,147 MMBtu/hr for each CTG. The turbines are existing simple cycle turbines that will be retrofit to be combined cycle units.	Particulate matter, filterable (FPM)	Good combustion practices	0.0042	LB/MMBTU	TEST PROTOCOL
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Natural gas fueled combined cycle combustion turbine generators (CTG)	15.21	Natural gas	2,147	MMBTU/H	FG-CTG1-4: Four natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. Two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner, a selective catalytic reduction (SCR) system, and a catalytic oxidation system. The throughput capacity is 2,147 MMBtu/hr for each CTG. The turbines are existing simple cycle turbines that will be retrofit to be combined cycle units.	Particulate matter, total 10µ (TPM10)	Good combustion practices	0.0042	LB/MMBTU	TEST PROTOCOL
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Natural gas fueled combined cycle combustion turbine generators (CTG)	15.21	Natural gas	2,147	MMBTU/H	FG-CTG1-4: Four natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. Two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner, a selective catalytic reduction (SCR) system, and a catalytic oxidation system. The throughput capacity is 2,147 MMBtu/hr for each CTG. The turbines are existing simple cycle turbines that will be retrofit to be combined cycle units.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices	0.0042	LB/MMBTU	TEST PROTOCOL
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG/DB1-4 Natural gas fueled combined cycle combustion turbine generators; duct burner on HRSG	15.21	Natural gas	2,807	MMBTU/H	Four natural gas-fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system, and a catalytic oxidation system. Additionally, the HRSG is operated with a natural gas fired duct burner during supplemental firing. The turbines are existing simple cycle turbines which will be retrofit to be combined cycle. Operational restriction is 4000 hrs/year that each DB can operate.	Particulate matter, filterable (FPM)	Good combustion practices	0.0073	LB/MMBTU	TEST PROTOCOL
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG/DB1-4 Natural gas fueled combined cycle combustion turbine generators; duct burner on HRSG	15.21	Natural gas	2,807	MMBTU/H	Four natural gas-fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system, and a catalytic oxidation system. Additionally, the HRSG is operated with a natural gas fired duct burner during supplemental firing. The turbines are existing simple cycle turbines which will be retrofit to be combined cycle. Operational restriction is 4000 hrs/year that each DB can operate.	Particulate matter, total 10µ (TPM10)	Good combustion practices	0.0073	LB/MMBTU	TEST PROTOCOL

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG/DB1-4 Natural gas fueled combined cycle combustion turbine generators; duct burner on HRSG	15.21	Natural gas	2,807	MMBTU/H	Four natural gas-fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system, and a catalytic oxidation system. Additionally, the HRSG is operated with a natural gas fired duct burner during supplemental firing. The turbines are existing simple cycle turbines which will be retrofit to be combined cycle. Operational restriction is 4000 hrs/year that each DB can operate.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices	0.0073	LB/MMBTU	TEST PROTOCOL
MORGAN CITY POWER PLANT	LOUISIANA ENERGY AND POWER AUTHORITY (LEPA)	LA		9/26/2013			Combustion Turbine with SCR/HRSG	15.21	Natural Gas	607.1	MMBTU/hr		Particulate matter, filterable 10µ (FPM10)	Good combustion practices and clean burning fuels (natural gas)	12.03	LB/H	HOURLY MAXIMUM
MORGAN CITY POWER PLANT	LOUISIANA ENERGY AND POWER AUTHORITY (LEPA)	LA		9/26/2013			Combustion Turbine with SCR/HRSG	15.21	Natural Gas	607.1	MMBTU/hr		Particulate matter, filterable 2.5µ (FPM2.5)	Good combustion practices and clean burning fuel (natural gas)	12.03	LB/H	HOURLY MAXIMUM
SAND HILL ENERGY CENTER	CITY OF AUSTIN	TX	Joseph Ravi	9/13/2013	GE 7FA Natural Gas-fired Combined Cycle Turbine with DB fired HRSG		Natural gas-fired combined cycle turbines	15.21	Natural Gas	173.9	MW		Particulate matter, total 2.5µ (TPM2.5)				
BAYPORT COMPLEX	AIR LIQUIDE LARGE INDUSTRIES U.S., L.P.	TX	Jason Miller	9/5/2013	Air Liquid currently operates a cogeneration facility in Pasadena, Texas (Bayou Cogeneration Plant). The permit amendment submitted by Air Liquide will authorize a redevelopment project of its cogeneration plant. The proposed project will involve the replacement of four existing gas-fired turbines (GE 7EA) with similar gas-fired turbines (GE 7EA), the addition of three new gas-fired boilers rated at 550 MMBtu/hr and the removal of three existing gas-fired boilers rated at 443 MMBtu/hr.		(4) cogeneration turbines	15.21	natural gas	90	MW	(4) GE 7EA turbines providing power and process steam	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
CPV VALLEY ENERGY CENTER	CPV VALLEY LLC	NY		8/1/2013	CPV Valley Energy Center is a 680 MW combined cycle electric generating facility located in Middletown, NY. The combustion turbines are rated at 2,234 MMBTU/H firing natural gas and 2,145 MMBTU/H firing diesel fuel. The duct burners are rated for 500 MMBTU/H firing natural gas. In addition to the turbines their emission limits for the auxiliary boiler (73.5 MMBTU/H), emergency generator, fire pump, and gas heater.	State Facility Permit	Turbines and duct burners - NG	15.21	natural gas			Combined cycle units heat rate 7,605 BTU/KW-H (HHV) or less without duct burner firing to achieve design thermal efficiency of 57.4% (LHV).	Particulate matter, filterable (FPM)	Natural gas	0.0073	LB/MMBTU	1 H
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	15.21	natural gas	2,587	MMBTU/H heat input, each CTG	Natural gas fired CTG with DB for HRSG; 4 total. Technology A (4 total) is 2587 MMBTU/H design heat input each CTG. Technology B (4 total) is 2688 MMBTU/H design heat input each CTG. Permit was issued for either of two F Class turbine technologies with slight variations in emission rates. Applicant will select one technology. Installation is two separate CTG/HRSG trains driving one steam turbine electrical generator; Two 2X1 Blocks. Each CTG will be rated at 211 to 230 MW (gross) output and the station nominal generating capacity will be up to 1,400 MW.	Particulate matter, total 2.5µ (TPM2.5)	Combustion air filters, efficient combustion control, low sulfur natural gas fuel.	0.0066	LB/MMBTU	TEST PROTOCOL (3 1-H TESTS IF POSSIBLE)
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	15.21	natural gas	2,587	MMBTU/H heat input, each CTG	Natural gas fired CTG with DB for HRSG; 4 total. Technology A (4 total) is 2587 MMBTU/H design heat input each CTG. Technology B (4 total) is 2688 MMBTU/H design heat input each CTG. Permit was issued for either of two F Class turbine technologies with slight variations in emission rates. Applicant will select one technology. Installation is two separate CTG/HRSG trains driving one steam turbine electrical generator; Two 2X1 Blocks. Each CTG will be rated at 211 to 230 MW (gross) output and the station nominal generating capacity will be up to 1,400 MW.	Particulate matter, filterable (FPM)	Combustion air filters; efficient combustion control; low sulfur natural gas fuel.	0.0033	LB/MMBTU	TEST PROTOCOL; (3 1-H TESTS IF POSSIBLE)

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	15.21	natural gas	2,587	MMBTU/H heat input, each CTG	Natural gas fired CTG with DB for HRSG; 4 total. Technology A (4 total) is 2587 MMBTU/H design heat input each CTG. Technology B (4 total) is 2688 MMBTU/H design heat input each CTG. Permit was issued for either of two F Class turbine technologies with slight variations in emission rates. Applicant will select one technology. Installation is two separate CTG/HRSG trains driving one steam turbine electrical generator; Two 2X1 Blocks. Each CTG will be rated at 211 to 230 MW (gross) output and the station nominal generating capacity will be up to 1,400 MW.	Particulate matter, total 10µ (TPM10)	Combustion air filters; efficient combustion control; low sulfur natural gas fuel.	0.0066	LB/MMBTU	TEST PROTOCOL (3 1-H TESTS IF POSSIBLE)
MOORELAND GENERATING STA	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFECs system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are consideredgrandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	Combustion Turbine	15.21	Natural Gas	360	MW	This process represents the GE option for the project - One GE 7FA.05 natural gas-fired combustion turbine generator with an 820.5 MMBTUH duct burner.	Particulate matter, total 2.5µ (TPM2.5)	LOW ASH FUEL AND COMBUSTION CONTROL.	22.1	LB/HR	>50% LOAD W/O DUCT FIRING
MOORELAND GENERATING STA	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFECs system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are consideredgrandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	COMBUSTION TURBINE	15.21	NATURAL GAS	360	MW	This process represents the Siemens option for the project - One Siemens SGT6-5000F5 natural gas-fired combustion turbine generator with an 820.3 MMBTUH duct burner.	Particulate matter, total 2.5µ (TPM2.5)	LOW ASH FUEL AND COMBUSTION CONTROL.	22.2	LB/HR	>50% LOAD W/O DUCT FIRING
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, without duct burners	15.21	Natural Gas	515,600	MMSCF/rolling 12-months	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Particulate matter, total 10µ (TPM10)	clean burning fuel, only natural gas	13.3	LB/H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, with duct burners	15.21	Natural Gas	51,560	MMSCF/rolling 12-MO	Two Siemens 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Particulate matter, total 10µ (TPM10)	clean burning fuel, only natural gas	14	LB/H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, without duct burners	15.21	Natural Gas	47,917	MMSCF/rolling 12-MO	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Particulate matter, total 10µ (TPM10)	clean burning fuel, only natural gas	11.3	LB/H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, with duct burners	15.21	Natural Gas	47,917	MMSCF/rolling 12-MO	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Particulate matter, total 10µ (TPM10)	clean burning fuel, only natural gas	10.1	LB/H	
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG	15.21	Natural gas	2,237	MMBTU/H	Throughput is 2,237 MMBTU/H for each CTG Equipment is permitted as following flexible group (FG): FG-CTG1-2: Two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equpped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system.	Particulate matter, filterable (FPM)	Good combustion practices	0.006	LB/MMBTU	EACH CTG; TEST PROTOCOL

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG	15.21	Natural gas	2,237	MMBTU/H	Throughput is 2,237 MMBTU/H for each CTG Equipment is permitted as following flexible group (FG): FG-CTG1-2: Two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equpped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system.	Particulate matter, total 10µ (TPM10)	Good combustion practices	0.012	LB/MMBTU	EACH CTG; TEST PROTOCOL
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG	15.21	Natural gas	2,237	MMBTU/H	Throughput is 2,237 MMBTU/H for each CTG Equipment is permitted as following flexible group (FG): FG-CTG1-2: Two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equpped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices	0.012	LB/MMBTU	EACH CTG; TEST PROTOCOL
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG and duct burner (DB)	15.21	Natural gas	2,486	MMBTU/H	This process is permitted in a flexible group format, identified in the permit as FG-CTG/DB1-2 and is for two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. Additionally, the HRSG is operating with a natural gas fired duct burner for supplemental firing. The throughput is 2,486 MMBTU/H for each CTG/DB.	Particulate matter, filterable (FPM)	Good combustion practices	0.004	LB/MMBTU	TEST PROTOCOL
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG and duct burner (DB)	15.21	Natural gas	2,486	MMBTU/H	This process is permitted in a flexible group format, identified in the permit as FG-CTG/DB1-2 and is for two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. Additionally, the HRSG is operating with a natural gas fired duct burner for supplemental firing. The throughput is 2,486 MMBTU/H for each CTG/DB.	Particulate matter, total 10µ (TPM10)	Good combustion practices	0.008	LB/MMBTU	TEST PROTOCOL
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG and duct burner (DB)	15.21	Natural gas	2,486	MMBTU/H	This process is permitted in a flexible group format, identified in the permit as FG-CTG/DB1-2 and is for two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. Additionally, the HRSG is operating with a natural gas fired duct burner for supplemental firing. The throughput is 2,486 MMBTU/H for each CTG/DB.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices	0.008	LB/MMBTU	TEST PROTOCOL
HICKORY RUN ENERGY STATION	HICKORY RUN ENERGY LLC	PA	David Wilson	4/23/2013	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 900 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The project will also include a natural gasfired auxiliary boiler; a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other balance of plant equipment.		COMBINED CYCLE UNITS #1 and #2	15.21	Natural Gas	3.4	MMCF/HR	The Permittee shall select and install any of the turbine options listed below (or newer versions of these turbines if the Department determines that such newer versions achieve equivalent or better emissions rates and exhaust parameters) 1. General Electric 7FA (GE 7FA) 2. Siemens SGT6-5000F (Siemens F) 3. Mitsubishi M501G (Mitsubishi G) 4. Siemens SGT6-8000H (Siemens H) The emissions listed are for the Siemens SGT6-8000H unit.	Particulate matter, fugitive		18.5	LB/H W/ DUCT BURNER	11.0 LB/HR WITHOUT

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SUNBURY GENERATION LP/SUNBURY SES	SUNBURY GENERATION LP	PA	Mark Crawford	4/1/2013	This plan approval is for the repowering of the Sunbury Generation facility. This project will be for the construction of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners. The project will also be for the construction of a natural gas fired auxiliary boiler to assist with startup and shutdown activities and a small natural gas fired dew point heater. As part of the project all of the facility's existing coal fired utility boilers will be permanently retired.		Combined Cycle Combustion Turbine AND DUCT BURNER (3)	15.21	Natural Gas	2,538,000	MMBTU/H	Three powerblocks consisting of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners.	Particulate matter, total (TPM)		0.0088	LB/MMBTU	
BRUNSWICK COUNTY POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Jeffrey Zehner	3/12/2013	New, combined-cycle, natural gas-fired, electrical power generating facility.		COMBUSTION TURBINE GENERATORS, (3)	15.21	Natural Gas	3,442	MMBTU/H	Three (3) Mitsubishi M501 GAC combustion turbine generators with HRSG duct burners (natural gas-fired).	Particulate matter, total 2.5µ (TPM2.5)	Low sulfur/carbon fuel and good combustion practices.	0.0033	LB/MMBTU	3 H AVG/WITHOUT DUCT BURNING
BRUNSWICK COUNTY POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Jeffrey Zehner	3/12/2013	New, combined-cycle, natural gas-fired, electrical power generating facility.		COMBUSTION TURBINE GENERATORS, (3)	15.21	Natural Gas	3,442	MMBTU/H	Three (3) Mitsubishi M501 GAC combustion turbine generators with HRSG duct burners (natural gas-fired).	Particulate matter, total 10µ (TPM10)	Low sulfur/carbon fuel and good combustion practices.	0.0033	LB/MMBTU	3 H AVG/WITHOUT DUCT BURNING
LA PALOMA ENERGY CENTER	LA PALOMA ENERGY CENTER, LLC	TX	Gary Neus	2/7/2013	The proposed project is a new electric power plant, fueled by pipeline quality natural gas. The design of the plant is standard combined cycle (CC) technology.		(2) combined cycle turbines	15.21	natural gas	650	MW	The specific equipment includes two combustion turbines (CTs) connected to electric generators, producing between 183 and 232 MW of electricity, depending on ambient temperature and the selected CT. The two HRSGs use duct burners rated at 750 MMBtu/hr each to supplement the heat energy from the CTs. The steam from the two HRSGs is combined and routed to a single steam turbine driving a third electric generator with an electricity output capacity of 271 MW. Depending on the selected CT, total plant output at 59°F is between 637 MW and 735 MW. The applicant is considering three models of CT; one model will be selected and the permit revised to reflect the selection before construction begins. The three CT models are: (1) General Electric 7FA.04; (2) Siemens SGT6-5000F(4); or (3) Siemens SGT6-5000F(5).	Particulate matter, total 2.5µ (TPM2.5)	natural gas as fuel			
MOXIE ENERGY LLC/PATRIOT GENERATION PLT	MOXIE ENERGY LLC	PA	Kent Morton	1/31/2013	This plan approval is for the construction of two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner. The two powerblocks constructed pursuant to this plan approval will be either the two powerblocks rated 472 megawatts (MW) (P101 and P102) or the powerblocks rated 458 MW (P103 and P104). Additionally, this plan approval is for the construction of a 1464 bhp diesel-fired emergency generator, 460 bhp dieselfired fire pump, 1600 gallon diesel tank, 300 gallon diesel tank, two 15,000 gallon (each) lube oil tanks and ancillary electrical equipment.		Combined Cycle Power Blocks 472 MW - (2)	15.21	Natural Gas			Two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner.	Particulate matter, total (TPM)		0.0057	LB/MMBTU	
MOXIE ENERGY LLC/PATRIOT GENERATION PLT	MOXIE ENERGY LLC	PA	Kent Morton	1/31/2013	This plan approval is for the construction of two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner. The two powerblocks constructed pursuant to this plan approval will be either the two powerblocks rated 472 megawatts (MW) (P101 and P102) or the powerblocks rated 458 MW (P103 and P104). Additionally, this plan approval is for the construction of a 1464 bhp diesel-fired emergency generator, 460 bhp dieselfired fire pump, 1600 gallon diesel tank, 300 gallon diesel tank, two 15,000 gallon (each) lube oil tanks and ancillary electrical equipment.		Combined Cycle Power Blocks 472 MW - (2)	15.21	Natural Gas			Two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner.	Particulate matter, total 10µ (TPM10)		0.0057	LB/MMBTU	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MOXIE ENERGY LLC/PATRIOT GENERATION PLT	MOXIE ENERGY LLC	PA	Kent Morton	1/31/2013	This plan approval is for the construction of two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner. The two powerblocks constructed pursuant to this plan approval will be either the two powerblocks rated 472 megawatts (MW) (P101 and P102) or the powerblocks rated 458 MW (P103 and P104). Additionally, this plan approval is for the construction of a 1464 bhp diesel-fired emergency generator, 460 bhp dieselfired fire pump, 1600 gallon diesel tank, 300 gallon diesel tank, two 15,000 gallon (each) lube oil tanks and ancillary electrical equipment.		Combined Cycle Power Blocks 472 MW - (2)	15.21	Natural Gas			Two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner.	Particulate matter, total 2.5µ (TPM2.5)		0.0057	LB/MMBTU	
GARRISON ENERGY CENTER	GARRISON ENERGY CENTER, LLC/ CALPINE CORPORATION	DE	Stuart Widom	1/30/2013	one (1) 309 MW GE Combined Cycle Combustion Turbine Generating system fired principally on Natural Gas, one (1) 86,000 GPM Cooling Tower, one (1) 1,400,000 ULSD Storage Tank		Unit 1	15.21	Natural Gas	2,260	million BTUs		Particulate matter, total (TPM)	Fuel Usage Restriction to natural gas and low sulfur distillate oil	120.4	TONS	12 MONTH ROLLING AVERAGE
DUKE ENERGY HANGING ROCK ENERGY	DUKE ENERGY HANGING ROCK, LLC	OH	Andrew Roebel	12/18/2012	Four Natural Gas Fired Combustion Turbines, with Duct Burners; Combined Cycle, each 172 MW	This is a modification of RBLC OH-0252 to remove operating hour restrictions on duct burners, with changes to hourly limits without increasing the annual emission limitations. Original PTI # was 07-00503	Turbines (4) (model GE 7FA) Duct Burners Off	15.21	NATURAL GAS	172	MW	Four GE 7FA combined cycle turbines, dry low NOx burners and selective catalytic reduction. These limits are for each of the 4 turbines individually, while operating with the duct burners off. This permit is a modification to RBLC OH-0252 to remove hourly restrictions on duct burners.	Particulate matter, total 10µ (TPM10)	Burning natural gas in an efficient combustion turbine	15	LB/H	
DUKE ENERGY HANGING ROCK ENERGY	DUKE ENERGY HANGING ROCK, LLC	OH	Andrew Roebel	12/18/2012	Four Natural Gas Fired Combustion Turbines, with Duct Burners; Combined Cycle, each 172 MW	This is a modification of RBLC OH-0252 to remove operating hour restrictions on duct burners, with changes to hourly limits without increasing the annual emission limitations. Original PTI # was 07-00503	Turbines (4) (model GE 7FA) Duct Burners On	15.21	NATURAL GAS	172	MW	Four GE 7FA combined cycle turbines, dry low NOx burners and selective catalytic reduction. These limits are for each of the 4 turbines individually, while operating with the duct burners on. This permit is a modification to RBLC OH-0252 to remove hourly restrictions on duct burners.	Particulate matter, total 10µ (TPM10)	Burning natural gas in an efficient combustion turbine	19.9	LB/H	
ST. JOSEPH ENERGY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	2,300	MMBTU/H	EACH TURBINE IS EQUIPED WITH DRY LOW NOX BURNERS, NATURAL GAS FIRED DUCT BURNERS, AND A HEAT RECOVERY STEAM GENERATOR IDENTIFIED AS HRSG#. NOX EMISSIONS CONTROLLED BY SELECTIVE CATALYTIC REDUCTION SYSTEMS (SCR##) ALONG WITH CO AND VOC EMISSSIONS CONTROLLED BY OXIDATION CATAYLST SYSTEMS (CAT##) IN EACH TURBINE. EACH STACK HAS CONTINUOUS EMISSIONS MONITORS FOR NOX AND CO. COMBINED NOMIAL POWER OUTPUT IS 1.350 MW.	Particulate matter, filterable (FPM)	GOOD CUMBUSTION PRACTICE AND FUEL SPECIFICATION	18	LB/H	3 HOURS
ST. JOSEPH ENERGY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	2,300	MMBTU/H	EACH TURBINE IS EQUIPED WITH DRY LOW NOX BURNERS, NATURAL GAS FIRED DUCT BURNERS, AND A HEAT RECOVERY STEAM GENERATOR IDENTIFIED AS HRSG#. NOX EMISSIONS CONTROLLED BY SELECTIVE CATALYTIC REDUCTION SYSTEMS (SCR##) ALONG WITH CO AND VOC EMISSSIONS CONTROLLED BY OXIDATION CATAYLST SYSTEMS (CAT##) IN EACH TURBINE. EACH STACK HAS CONTINUOUS EMISSIONS MONITORS FOR NOX AND CO. COMBINED NOMIAL POWER OUTPUT IS 1.350 MW.	Particulate matter, filterable 10µ (FPM10)	GOOD CUMBUSTION PRACTICE AND FUEL SPECIFICATION	18	LB/H	3 HOURS
ST. JOSEPH ENERGY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	2,300	MMBTU/H	EACH TURBINE IS EQUIPED WITH DRY LOW NOX BURNERS, NATURAL GAS FIRED DUCT BURNERS, AND A HEAT RECOVERY STEAM GENERATOR IDENTIFIED AS HRSG#. NOX EMISSIONS CONTROLLED BY SELECTIVE CATALYTIC REDUCTION SYSTEMS (SCR##) ALONG WITH CO AND VOC EMISSSIONS CONTROLLED BY OXIDATION CATAYLST SYSTEMS (CAT##) IN EACH TURBINE. EACH STACK HAS CONTINUOUS EMISSIONS MONITORS FOR NOX AND CO. COMBINED NOMIAL POWER OUTPUT IS 1.350 MW.	Particulate matter, filterable 2.5µ (FPM2.5)	GOOD COMBUSTION PRACTICE AND FUEL SPECIFICATION	18	LB/H	3 HOURS
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined cylce turbine with duct burner	15.21	natural gas	39,463	mmcubic ft/year*	* Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler	Particulate matter, filterable 10µ (FPM10)	Use of natural gas a clean burning fuel	13.2	LB/H	AVERAGE OF THREE TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined cylce turbine with duct burner	15.21	natural gas	39,463	mmcubic ft/year*	* Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler	Particulate matter, filterable 2.5µ (FPM2.5)	Use of natural gas a clean burning fuel	13.2	LB/H	AVERAGE OF THREE TESTS
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined cylce turbine with duct burner	15.21	natural gas	39,463	mmcubic ft/year*	* Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler	Particulate matter, filterable (FPM)	Use of natural gas a clean burning fuel	7.9	LB/H	AVERAGE OF THREE TESTS
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined Cycle Combustion Turbine	15.21	natural gas	39,463	MMCubic ft/yr	Fuel: Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler CO2e = 2,000,268 t/yr for the facility (2 turbines, 2 duct burners and 1 auxiliary boiler, 1 emergency generator and 1 fire pump)	Particulate matter, filterable (FPM)	Good combustion Practices and use of natural gas a clean burning fuel	6.6	LB/H	AVERAGE OF THREE TESTS
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined Cycle Combustion Turbine	15.21	natural gas	39,463	MMCubic ft/yr	Fuel: Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler CO2e = 2,000,268 t/yr for the facility (2 turbines, 2 duct burners and 1 auxiliary boiler, 1 emergency generator and 1 fire pump)	Particulate matter, filterable 10µ (FPM10)	Use of natural gas a clean burning fuel	11	LB/H	AVERAGE OF THREE TESTS
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined Cycle Combustion Turbine	15.21	natural gas	39,463	MMCubic ft/yr	Fuel: Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler CO2e = 2,000,268 t/yr for the facility (2 turbines, 2 duct burners and 1 auxiliary boiler, 1 emergency generator and 1 fire pump)	Particulate matter, filterable 2.5µ (FPM2.5)	Use of Natural Gas a clean burning fuel	11	LB/H	AVERAGE OF THREE TESTS
CHANNEL ENERGY CENTER LLC	CHANNEL ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	10/15/2012	Combustion turbine (Siemens 501F)/duct burners (475 MMBtu/hr) with heat recovery steam generator	42179 and N021M1	Combined Cycle Turbine	15.21	natural gas	180	MW	The turbine is a Siemens 501F rated at a nominal 180 MW and the duct burner will have a maximum design heat input of 475 MMBtu/hr.	Particulate matter, total (TPM)	Good combustion and the use of gaseous fuel	27	LB/H	
CHANNEL ENERGY CENTER LLC	CHANNEL ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	10/15/2012	Combustion turbine (Siemens 501F)/duct burners (475 MMBtu/hr) with heat recovery steam generator	42179 and N021M1	Combined Cycle Turbine	15.21	natural gas	180	MW	The turbine is a Siemens 501F rated at a nominal 180 MW and the duct burner will have a maximum design heat input of 475 MMBtu/hr.	Particulate matter, total 10µ (TPM10)	good combustion and the use of gaseous fuel	27	LB/H	
CHANNEL ENERGY CENTER LLC	CHANNEL ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	10/15/2012	Combustion turbine (Siemens 501F)/duct burners (475 MMBtu/hr) with heat recovery steam generator	42179 and N021M1	Combined Cycle Turbine	15.21	natural gas	180	MW	The turbine is a Siemens 501F rated at a nominal 180 MW and the duct burner will have a maximum design heat input of 475 MMBtu/hr.	Particulate matter, total 2.5µ (TPM2.5)	good combustion and the use of gaseous fuel	27	LB/H	
POLK POWER STATION	TAMPA ELECTRIC COMPANY	FL	Paul Carpinone	10/14/2012	The Polk Power Station consists of: a nominal 250 MW (net) solid fuel-based integrated gasification and combined cycle (Unit 1) including a sulfuric acid plant and an auxiliary boiler; four natural gas-fueled nominal 165 MW simple cycle combustion turbine-electrical generators (CTGs) designated as Units 2, 3, 4 and 5; and ancillary equipment. Units 2 and 3 are equipped with backup fuel oil-firing capability.	GHG(e) emissions: 4,307,862	Combine cycle power block (4 on 1)	15.21	natural gas	1,160	MW	Basis for the emission standard is either NSPS Subpart KKKK or Department BACT determinations. The BACT emission standards for NOX while operating in combined cycle are more stringent than the corresponding Subpart KKKK emissions standards of 15 and 42 ppmvd @15% O2 on a 30-day rolling average for natural gas and fuel oil, respectively.	Particulate matter, filterable 10µ (FPM10)	work practices	2	GR S/100 SCF OF GAS	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MOXIE LIBERTY LLC/ASYLUM POWER PL T	MOXIE ENERGY LLC	PA	Kent J Morton	10/10/2012		The project consists of two identical 1 x 1 power blocks, and each block includes a combustion gas turbine and a steam turbine. Each combined-cycle process will also include a heat recovery steam generator and supplemental duct burners. Additionally, one diesel-fired emergency generator, one diesel-fired fire water pump, two diesel fuel storage tanks, two lube oil storage tanks, and one aqueous ammonia storage tank were proposed to be constructed and operated. Each combined-cycle process will be rated at 468 MW or less.	Combined-cycle Turbines (2) - Natural gas fired	15.21	Natural Gas	3,277	MMBTU/H	Two combine cycle Turbines, each with a combustion turbine and heat recovery steam generator with duct burner. Each combined-cycle process will be rated at 468 MW or less. The heat input rating of each combustion gas turbine is 2890 MMBtu/hr (HHV) or less, and the heat input rating of each supplemental duct burner is equal to 387 MMBtu/hr (HHV) or less.	Particulate matter, total (TPM)	Using fuel with little or no ash and sulfur content.	0.004	LB/MMBTU	FOR 468 MW POWERBLOCK
DEER PARK ENERGY CENTER	DEER PARK ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	9/26/2012	The Deer Park Energy Center is a combined cycle cogeneration facility consisting of five Siemens/Westinghouse 501F combustion turbine generators, each with a 725 MMBtu/hr duct burner and heat recovery steam generator.	45642 and N036M2	Combined Cycle Turbine	15.21	natural gas	180	MW	natural gas-fired combined cycle turbine generator with a heat recovery steam generator equipped with a duct burner. The turbine is a Siemens 501F rated at a nominal 180 megawatts and the DB will have a maximum design rate capability of 725 million British thermal units per hour	Particulate matter, total (TPM)	good combustion and use of natural gas	27	LB/H	
DEER PARK ENERGY CENTER	DEER PARK ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	9/26/2012	The Deer Park Energy Center is a combined cycle cogeneration facility consisting of five Siemens/Westinghouse 501F combustion turbine generators, each with a 725 MMBtu/hr duct burner and heat recovery steam generator.	45642 and N036M2	Combined Cycle Turbine	15.21	natural gas	180	MW	natural gas-fired combined cycle turbine generator with a heat recovery steam generator equipped with a duct burner. The turbine is a Siemens 501F rated at a nominal 180 megawatts and the DB will have a maximum design rate capability of 725 million British thermal units per hour	Particulate matter, total 10µ (TPM10)	good combustion and the use of natural gas	27	LB/H	
DEER PARK ENERGY CENTER	DEER PARK ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	9/26/2012	The Deer Park Energy Center is a combined cycle cogeneration facility consisting of five Siemens/Westinghouse 501F combustion turbine generators, each with a 725 MMBtu/hr duct burner and heat recovery steam generator.	45642 and N036M2	Combined Cycle Turbine	15.21	natural gas	180	MW	natural gas-fired combined cycle turbine generator with a heat recovery steam generator equipped with a duct burner. The turbine is a Siemens 501F rated at a nominal 180 megawatts and the DB will have a maximum design rate capability of 725 million British thermal units per hour	Particulate matter, total 2.5µ (TPM2.5)		27	LB/H	
ES JOSLIN POWER PLANT	CALHOUN PORT AUTHORITY	TX	Charles Hausmann	9/12/2012	Three gas-fired combined cycle turbine generators, including a steam turbine generator, to replace the existing steam boiler/turbine generator.	96336	Combined cycle gas turbine	15.21	natural gas	195	MW	The three combustion turbine generators (CTG) will be the General Electric 7FA, each with a maximum base-load electric power output of approximately 195 megawatts (MW). The steam turbine is rated at approximately 235 MW. This project also includes the installation of two emergency generators, one fire water pump, and auxiliary equipment. No duct burners.	Particulate matter, total 2.5µ (TPM2.5)		18	LB/H	PER TURBINE
ES JOSLIN POWER PLANT	CALHOUN PORT AUTHORITY	TX	Charles Hausmann	9/12/2012	Three gas-fired combined cycle turbine generators, including a steam turbine generator, to replace the existing steam boiler/turbine generator.	96336	Combined cycle gas turbine	15.21	natural gas	195	MW	The three combustion turbine generators (CTG) will be the General Electric 7FA, each with a maximum base-load electric power output of approximately 195 megawatts (MW). The steam turbine is rated at approximately 235 MW. This project also includes the installation of two emergency generators, one fire water pump, and auxiliary equipment. No duct burners.	Particulate matter, total 10µ (TPM10)	good combustion and natural gas as fuel	18	LB/H	PER TURBINE
ES JOSLIN POWER PLANT	CALHOUN PORT AUTHORITY	TX	Charles Hausmann	9/12/2012	Three gas-fired combined cycle turbine generators, including a steam turbine generator, to replace the existing steam boiler/turbine generator.	96336	Combined cycle gas turbine	15.21	natural gas	195	MW	The three combustion turbine generators (CTG) will be the General Electric 7FA, each with a maximum base-load electric power output of approximately 195 megawatts (MW). The steam turbine is rated at approximately 235 MW. This project also includes the installation of two emergency generators, one fire water pump, and auxiliary equipment. No duct burners.	Particulate matter, total (TPM)	good combustion and natural gas as fuel	18	LB/H	PER TURBINE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Combined Cycle Turbine (EP01)	15.21	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Combined Cycle Turbine (EP02)	15.21	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE
GATEWAY COGENERATION 1, LLC - SMART WATER PROJECT	GATEWAY GREEN ENERGY	VA	T. Edward Mcdaniel	8/27/2012	Combined cycle electrical power generating facility (160 MW), consisting of two combusion turbines (Rolls Royce Trent 60 WLE) with associated HRSG and no duct burning.		COMBUSTION TURBINES, (2)	15.21	Natural Gas	593	MMBTU/H	Burns primarily natural gas but has the capacity to burn up to 500 hours of ultra low sulfur diesel fuel (ULSD) as backup.	Particulate matter, total 2.5µ (TPM2.5)	Clean burning fuels and good combustion practices.	5	LB/H	3 H AVG
GATEWAY COGENERATION 1, LLC - SMART WATER PROJECT	GATEWAY GREEN ENERGY	VA	T. Edward Mcdaniel	8/27/2012	Combined cycle electrical power generating facility (160 MW), consisting of two combusion turbines (Rolls Royce Trent 60 WLE) with associated HRSG and no duct burning.		COMBUSTION TURBINES, (2)	15.21	Natural Gas	593	MMBTU/H	Burns primarily natural gas but has the capacity to burn up to 500 hours of ultra low sulfur diesel fuel (ULSD) as backup.	Particulate matter, total 10µ (TPM10)	Clean-burning fuels and good combustion practices.	5	LB/H	3 H AVG

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural gas	40,297.6	mmcubic ft/year	Woodbridge Energy Center (WEC), located at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, will be a new 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) each with a maximum rated heat input of 2,307 million British thermal units per hour (MMBtu/hr), that will utilize pipeline natural gas only, with 2 HRSGs, 2 Duct Burners (each 500 MMbtu/hr).	Particulate matter, filterable (FPM)	Good Combustion Practices and use of Natural gas,a clean burning fuel.	8.2	LB/H	AVERAGE OF THREE TESTS.
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural gas	40,297.6	mmcubic ft/year	Woodbridge Energy Center (WEC), located at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, will be a new 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) each with a maximum rated heat input of 2,307 million British thermal units per hour (MMBtu/hr), that will utilize pipeline natural gas only, with 2 HRSGs, 2 Duct Burners (each 500 MMbtu/hr).	Particulate matter, total 10µ (TPM10)	Good Combustion Practices and use of Natural gas,a clean burning fuel.	19.1	LB/H	AVERAGE OF THREE TESTS
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural gas	40,297.6	mmcubic ft/year	Woodbridge Energy Center (WEC), located at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, will be a new 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) each with a maximum rated heat input of 2,307 million British thermal units per hour (MMBtu/hr), that will utilize pipeline natural gas only, with 2 HRSGs, 2 Duct Burners (each 500 MMbtu/hr).	Particulate matter, total 2.5µ (TPM2.5)	Good Combustion Practices and use of Natural gas,a clean burning fuel.	19.1	LB/H	AVERAGE OF THREE TESTS
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine w/o duct burner	15.21	natural gas	40,297.6	mmcubic ft/year	The above natural gas use is combined for two GE 7FA CC turbines (each with a maximum heat input of 2, 307 MMBtu/hr)and two duct burners (each with a maximum heat input of 500 MMBtu/hr)	Particulate matter, filterable (FPM)	use of natural gas only which is a clean burning fuel	4.8	LB/H	AVERAGE OF THREE TESTS
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine w/o duct burner	15.21	natural gas	40,297.6	mmcubic ft/year	The above natural gas use is combined for two GE 7FA CC turbines (each with a maximum heat input of 2, 307 MMBtu/hr)and two duct burners (each with a maximum heat input of 500 MMBtu/hr)	Particulate matter, total 2.5µ (TPM2.5)	Use of Natural gas,a clean burning fuel.	12.1	LB/H	AVERAGE OF THREE TESTS
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine w/o duct burner	15.21	natural gas	40,297.6	mmcubic ft/year	The above natural gas use is combined for two GE 7FA CC turbines (each with a maximum heat input of 2, 307 MMBtu/hr)and two duct burners (each with a maximum heat input of 500 MMBtu/hr)	Particulate matter, total 10µ (TPM10)	use of natural gas only which is a clean burning fuel	12.1	LB/H	AVERAGE OF THREE TESTS

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
COGENERATION PLANT	WESTLAKE VINYLS COMPANY LP	LA	Karen Khonsari	12/6/2011	COGENERATION PLANT AT SYNTHETIC ORGANIC CHEMICAL MANUFACTURING FACILITY	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS FWE REPRESENT POTENTIAL EMISSIONS ASSOCIATED WITH THE COGENERATION PLANT. NOX NETTED OUT OF PSD/NNSR.	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	15.21	NATURAL GAS	475	MMBTU/H	EACH COGEN TRAIN CONSISTS OF A 50 MW GE LM6000 PF SPRINT TURBINE AND A HEAT RECOVERY STEAM GENERATOR EQUIPPED WITH A 70 MM BTU/HR DUCT BURNER.	Particulate matter, total 10µ (TPM10)	USE OF NATURAL GAS AS FUEL AND GOOD COMBUSTION PRACTICES	3.72	LB/H	HOURLY MAXIMUM
COGENERATION PLANT	WESTLAKE VINYLS COMPANY LP	LA	Karen Khonsari	12/6/2011	COGENERATION PLANT AT SYNTHETIC ORGANIC CHEMICAL MANUFACTURING FACILITY	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS FWE REPRESENT POTENTIAL EMISSIONS ASSOCIATED WITH THE COGENERATION PLANT. NOX NETTED OUT OF PSD/NNSR.	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	15.21	NATURAL GAS	475	MMBTU/H	EACH COGEN TRAIN CONSISTS OF A 50 MW GE LM6000 PF SPRINT TURBINE AND A HEAT RECOVERY STEAM GENERATOR EQUIPPED WITH A 70 MM BTU/HR DUCT BURNER.	Particulate matter, total 2.5µ (TPM2.5)	USE OF NATURAL GAS AS FUEL AND GOOD COMBUSTION PRACTICES	3.72	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Combined Cycle Refrigeration Compressor Turbines (8)	15.21	natural gas	286	MMBTU/H	GE LM2500+G4	Particulate matter, total (TPM)	Good combustion practices and fueled by natural gas	2.08	LB/H	HOURLY MAXIMUM
SUMPTER POWER PLANT	WOLVERINE POWER SUPPLY COOPERATIVE INC.	MI	Brian Warner	11/17/2011	Utility--Natural gas fired combustion turbine	Other Facility Wide Pollutants not listed below: PM10 = 14.8 tpy PM2.5 = 14.8 tpy CO2e = 232,639 tpy	Combined cycle combustion turbine w/ HRSG	15.21	Natural gas	130	MW electrical output	This is a combined-cycle combustion turbine with a non-fired heat recovery steam generator (HRSG). Natural gas-fired combustion turbine conversion to combined-cycle.	Particulate matter, total 10µ (TPM10)		0.0066	LB/MMBTU	TEST
SUMPTER POWER PLANT	WOLVERINE POWER SUPPLY COOPERATIVE INC.	MI	Brian Warner	11/17/2011	Utility--Natural gas fired combustion turbine	Other Facility Wide Pollutants not listed below: PM10 = 14.8 tpy PM2.5 = 14.8 tpy CO2e = 232,639 tpy	Combined cycle combustion turbine w/ HRSG	15.21	Natural gas	130	MW electrical output	This is a combined-cycle combustion turbine with a non-fired heat recovery steam generator (HRSG). Natural gas-fired combustion turbine conversion to combined-cycle.	Particulate matter, total 2.5µ (TPM2.5)		0.0066	LB/MMBTU	TEST
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/18/2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/17/2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/28/2013.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	9-HR AVG (NO DUCT BURNING)
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/18/2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/17/2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/28/2013.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Particulate matter, total 10µ (TPM10)	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	9-HR AVG (NO DUCT BURNING)
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/18/2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/17/2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/28/2013.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Particulate matter, total 2.5µ (TPM2.5)	USE PUC QUALITY NATURAL GAS	0.0048	LB/MMBTU	9-HR AVG (NO DUCT BURNING)
THOMAS C. FERGUSON POWER PLANT	LOWER COLORADO RIVER AUTHORITY	TX	Joe Bentley	9/1/2011	Power Plant. Two natural gas-fired combined cycle turbine generators (GE 7FA) with unfired HRSG	93938	Natural gas-fired turbines	15.21	natural gas	390	MW	(2) GE7FA at 195 MW each, (1) steam turbine at 200 MW. Each turbine is equipped with an unfired heat recovery steam generator (HRSG), which provides steam for the steam turbine.	Particulate matter, total 2.5µ (TPM2.5)	pipeline quality natural gas	33.43	LB/H	1-H
NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	Christee Herbert	8/16/2011	1827 MW POWER PLANT (PRE-PROJECT). NATURAL GAS IS PRIMARY FUEL; NO. 2 NO. 4 FUEL OIL ARE SECONDARY FUELS. PROJECT INVOLVES DECOMMISSIONING OF 2 BOILERS AND THE CONSTRUCTION OF 2 COMBINED CYCLE GAS TURBINES WITH DUCT BURNERS, A NATURAL GAS-FIRED AUXILIARY BOILER, A DIESEL GENERATOR, 2 COOLING TOWERS, A FUEL OIL STORAGE TANK, A DIESEL-FIRED FIREWASTER PUMP, AND AN ANHYDROUS AMMONIA TANK. FUELS FOR THE TURBINES INCLUDE NATURAL GAS, NO. 2 FUEL OIL, AND ULTRA LOW SULFUR DIESEL.	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A 6B)	15.21	NATURAL GAS	7,146	MMBTU/H	TURBINES ALSO PERMITTED TO BURN NO. 2 FUEL OIL AND ULTRA LOW SULFUR DIESEL. FUEL OIL USE IS LIMITED TO 1000 HOURS PER YEAR.	Particulate matter, total 2.5µ (TPM2.5)	WHILE FIRING NATURAL GAS: USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES WHILE FIRING FUEL OIL: USE OF ULTRA LOW SULFUR FUEL OIL AND GOOD COMBUSTION PRACTICES	26.23	LB/H	HOURLY AVERAGE W/O DUCT BURNER

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
NINEMILE POINT ELECTRIC GENERATING PLANT	ENTERGY LOUISIANA LLC	LA	Christee Herbert	8/16/2011	1827 MW POWER PLANT (PRE-PROJECT). NATURAL GAS IS PRIMARY FUEL; NO. 2 NO. 4 FUEL OIL ARE SECONDARY FUELS. PROJECT INVOLVES DECOMMISSIONING OF 2 BOILERS AND THE CONSTRUCTION OF 2 COMBINED CYCLE GAS TURBINES WITH DUCT BURNERS, A NATURAL GAS-FIRED AUXILIARY BOILER, A DIESEL GENERATOR, 2 COOLING TOWERS, A FUEL OIL STORAGE TANK, A DIESEL-FIRED FIREWASTER PUMP, AND AN ANHYDROUS AMMONIA TANK. FUELS FOR THE TURBINES INCLUDE NATURAL GAS, NO. 2 FUEL OIL, AND ULTRA LOW SULFUR DIESEL.	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS BACT FOR GREENHOUSE GASES (CO2E) FROM THE COMBINED CYCLE TURBINE GENERATORS (UNITS 6A & 6B) IS OPERATING PROPERLY AND PERFORMING NECESSARY ROUTINE MAINTENANCE, REPAIR, AND REPLACEMENT TO MAINTAIN THE GROSS HEAT RATE AT OR BELOW 7630 BTU/KW-HR (HHV) (ANNUAL AVERAGE).	COMBINED CYCLE TURBINE GENERATORS (UNITS 6A 6B)	15.21	NATURAL GAS	7,146	MMBTU/H	TURBINES ALSO PERMITTED TO BURN NO. 2 FUEL OIL AND ULTRA LOW SULFUR DIESEL. FUEL OIL USE IS LIMITED TO 1000 HOURS PER YEAR.	Particulate matter, total 10µ (TPM10)	WHILE FIRING NATURAL GAS: USE OF PIPELINE QUALITY NATURAL GAS AND GOOD COMBUSTION PRACTICES WHILE FIRING FUEL OIL: USE OF ULTRA LOW SULFUR FUEL OIL AND GOOD COMBUSTION PRACTICES	26.23	LB/H	HOURLY AVERAGE W/O DUCT BURNER
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	8.91	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PUC QUALITY NATURAL GAS	8.91	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	11.78	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PUC QUALITY NATURAL GAS	11.78	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	8.91	LB/H	12-MONTH ROLLING AVG

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PUC QUALITY NATURAL GAS	8.91	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	11.78	LB/H	12-MONTH ROLLING AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/18/2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/18/2013. The applicant requested an extension of the PSD permit on 2/5/2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PUC QUALITY NATURAL GAS	11.78	LB/H	12-MONTH ROLLING AVG
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (HOT STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total (TPM)	USE NATURAL GAS	12	LB/H	HOT STARTUP PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (HOT STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total 10µ (TPM10)	USE NATURAL GAS	12	LB/H	HOT STARTUP PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (SHUTDOWN PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total (TPM)	USE NATURAL GAS	6	LB/H	TURBINE SHUTDOWN PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (SHUTDOWN PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total 10µ (TPM10)	USE NATURAL GAS	6	LB/H	TURBINE SHUTDOWN PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total 10µ (TPM10)	USE NATURAL GAS	13.5	LB/H	STACK TEST
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, filterable (FPM)	USE NATURAL GAS	13.5	LB/H	STACK TEST
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (COLD STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, filterable (FPM)	USE NATURAL GAS	12	LB/H	COLD STARTUP PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/29/2008, amended on 3/19/2010 to revise startup and shutdown emission limits, and amended again on 3/11/2011 to incorporate technical corrections.	COMBUSTION TURBINES (COLD STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/HR DUCT BURNER AND HRSG.	Particulate matter, total 10µ (TPM10)	USE NATURAL GAS	12	LB/H	COLD STARTUP PERIODS
CARTY PLANT	PORTLAND GENERAL ELECTRIC	OR		12/29/2010	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENERATING UNIT PSD PERMIT	PSD PERMIT	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENERATING UNIT	15.21	NATURAL GAS	2,866	MMBTU/H		Particulate matter, filterable 10µ (FPM10)	CLEAN FUEL	2.5	LB/MMCF	

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
NELSON ENERGY CENTER	INVENERGY NELSON, LLC	IL	Joel Schroeder	12/28/2010	Natural gas-fired electic power generation facility with two combined cycle turbines followed by heat recovery steam generators (HRSG) and the capability for supplemental fuel firing in the HRSG for each turbine using duct burners. NOx emissions will be controlled by SCR and low NOx combustors.	LSP-Nelson Energy started construction pursuant to a permit issued in year 2000 for a facility that was not completed due to financial difficulties, which eventually resulted in LSP-Nelson entering bankruptcy. Substantial construction of foundations and infrastructure for all units and physical installation of one turbine were completed, including construction of HRSGs.	Electric Generation Facility	15.21	Natural Gas	220	MW each	Two combined cycle combustion turbines followed by HRSGs with capability for supplemental fuel firing in HRSG for each combustion turbine using duct burners.	Particulate matter, total 10µ (TPM10)		0.012	LB/MMBTU	HOURLY AVERAGE
NELSON ENERGY CENTER	INVENERGY NELSON, LLC	IL	Joel Schroeder	12/28/2010	Natural gas-fired electic power generation facility with two combined cycle turbines followed by heat recovery steam generators (HRSG) and the capability for supplemental fuel firing in the HRSG for each turbine using duct burners. NOx emissions will be controlled by SCR and low NOx combustors.	LSP-Nelson Energy started construction pursuant to a permit issued in year 2000 for a facility that was not completed due to financial difficulties, which eventually resulted in LSP-Nelson entering bankruptcy. Substantial construction of foundations and infrastructure for all units and physical installation of one turbine were completed, including construction of HRSGs.	Electric Generation Facility	15.21	Natural Gas	220	MW each	Two combined cycle combustion turbines followed by HRSGs with capability for supplemental fuel firing in HRSG for each combustion turbine using duct burners.	Particulate matter, total 2.5µ (TPM2.5)		0.006	LB/MMBTU	HOURLY AVERAGE
WARREN COUNTY POWER PLANT - DOMINION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Robert Bisha	12/17/2010	Virginia Electric and Power Company (Dominion) has proposed to construct and operate a combined-cycle electric power generating facility in Warren County with a nominal generating capacity of 1280 megawatts (MW) at ISO (International Organization for Standardization) conditions.	Equipment to be constructed at ths facility consists of: 3 Mitsubishi Model M501 GAC natural gas-fired combined-cylce turbines, each rated at 299,600 kW (2,996 MMBtu/hr. Each equipped with a heat recovery steam generator (HRSG) having a duct burner with a design rating of 500 MMBtu/hr. This permit supersedes the previous permit issued on 7/30/2004 to CPV Warren LLC.	COMBINED CYCLE TURBINE DUCT BURNER, 3	15.21	Natural Gas	2,996	MMBTU/H	Emissions are for one of three units (Mitsubishi natural gas-fired combustion turbine (CT) generator,Model M501 GAC).	Particulate matter, total 10µ (TPM10)	Natural Gas only, fuel has maximum sulfur content of 0.0003% by weight.	8	LB/H	3 HR AVG. (WITHOUT DUCT BURNER FIRING)
WARREN COUNTY POWER PLANT - DOMINION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Robert Bisha	12/17/2010	Virginia Electric and Power Company (Dominion) has proposed to construct and operate a combined-cycle electric power generating facility in Warren County with a nominal generating capacity of 1280 megawatts (MW) at ISO (International Organization for Standardization) conditions.	Equipment to be constructed at ths facility consists of: 3 Mitsubishi Model M501 GAC natural gas-fired combined-cylce turbines, each rated at 299,600 kW (2,996 MMBtu/hr. Each equipped with a heat recovery steam generator (HRSG) having a duct burner with a design rating of 500 MMBtu/hr. This permit supersedes the previous permit issued on 7/30/2004 to CPV Warren LLC.	COMBINED CYCLE TURBINE DUCT BURNER, 3	15.21	Natural Gas	2,996	MMBTU/H	Emissions are for one of three units (Mitsubishi natural gas-fired combustion turbine (CT) generator,Model M501 GAC).	Particulate matter, total 2.5µ (TPM2.5)	Natural Gas only, fuel has maximum sulfur content of 0.0003% by weight.	8	LB/H	3 HR AVG. (WITHOUT DUCT BURNER FIRING)
KING POWER STATION	PONDERA CAPITAL MANAGEMENT GP INC	TX	Mark Chrisos	8/5/2010	Four combined-cycle natural gas-fired combustion turbines	State permit number 84289 Nonattainment permit number N75	Turbine	15.21	natural gas	1,350	MW	The plant will be designed to generate 1,350 nominal megawatts of power. There are two configuration scenarios: either four Siemens SGT6-5000F CTGs in combined-cycle mode (Scenario A) or four GE Frame 7FA CTGs in combined cycle mode (Scenario B). Scenario B also includes one or two auxiliary boilers.	Particulate matter, total (TPM)	use low ash fuel (natural gas or low sulfur diesel as a backup) and good combustion practices	11.1	LB/H	
KING POWER STATION	PONDERA CAPITAL MANAGEMENT GP INC	TX	Mark Chrisos	8/5/2010	Four combined-cycle natural gas-fired combustion turbines	State permit number 84289 Nonattainment permit number N75	Turbine	15.21	natural gas	1,350	MW	The plant will be designed to generate 1,350 nominal megawatts of power. There are two configuration scenarios: either four Siemens SGT6-5000F CTGs in combined-cycle mode (Scenario A) or four GE Frame 7FA CTGs in combined cycle mode (Scenario B). Scenario B also includes one or two auxiliary boilers.	Particulate matter, total 10µ (TPM10)	use of low ash fuel (natural gas or low sulfur diesel as a backup)	11.1	LB/H	
KING POWER STATION	PONDERA CAPITAL MANAGEMENT GP INC	TX	Mark Chrisos	8/5/2010	Four combined-cycle natural gas-fired combustion turbines	State permit number 84289 Nonattainment permit number N75	Turbine	15.21	natural gas	1,350	MW	The plant will be designed to generate 1,350 nominal megawatts of power. There are two configuration scenarios: either four Siemens SGT6-5000F CTGs in combined-cycle mode (Scenario A) or four GE Frame 7FA CTGs in combined cycle mode (Scenario B). Scenario B also includes one or two auxiliary boilers.	Particulate matter, total 2.5µ (TPM2.5)	use of low ash fuel (natural gas or low sulfur diesel as a backup)	11.1	LB/H	
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Four combined cycle combution turbines	15.21	natural gas	373	MMBTU/H	Three GE, LMS6000 PF, natural gas-fired, combined cycle CTG, rated at 373 MMBtu per hour each, based on HHV and one (1) HRSG each with no Duct Burners	Particulate matter, total (TPM)	Use of pipeline quality natural gas and good combustor design	4.3	LB/H	AVE OVER STACK TEST LENGTH
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Four combined cycle combution turbines	15.21	natural gas	373	MMBTU/H	Three GE, LMS6000 PF, natural gas-fired, combined cycle CTG, rated at 373 MMBtu per hour each, based on HHV and one (1) HRSG each with no Duct Burners	Particulate matter, total 10µ (TPM10)	Use of pipeline quality natural gas and good combustor design	4.3	LB/H	AVE OVER STACK TEST LENGTH
LANGLEY GULCH POWER PLANT	IDAHO POWER COMPANY	ID		6/25/2010	ONE-ON-ONE COMBINED CYCLE PLANT CONSISTING OF (1) NATURAL GAS-FIRED COMBUSTION TURBINE (CT) AND (1) STEAM TURBINE. THE CT IS EQUIPPED WITH (1) HEAT RECOVERY STEAM GENERATOR (HRSG) AND DUCT BURNER. ANCILLARY EQUIPMENT INCLUDES (1) DIESEL-FIRED EMERGENCY GENERATOR, (1) DIESEL-FIRED FIRE PUMP, (1) WET COOLING TOWER, AND (6) DRY CHEMICAL STORAGE SILOS.		COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT BURNER	15.21	NATURAL GAS (ONLY)	2,375.28	MMBTU/H	SIEMENS SGT6-5000F COMBUSTION TURBINE (NGCT, CCGT) FOR ELECTRICAL GENERATION, NOMINAL 269 MW AND 2.1466 MMSCF/HR	Particulate matter, filterable 10µ (FPM10)	GOOD COMBUSTION PRACTICES (GCP)			SEE NOTE
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total (TPM)	PUC QUALITY NATURAL GAS	12	LB/H	12-MONTH ROLLING AVG (NO DUCT BURNING)

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total 2.5µ (TPM2.5)	PUC QUALITY NATURAL GAS	12	LB/H	PUC QUALITY NATURAL GAS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total (TPM)	PUC QUALITY NATURAL GAS	18	LB/H	12-MONTH ROLLING AVG (W/ DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total 2.5µ (TPM2.5)	PUC QUALITY NATURAL GAS	18	LB/H	12-MONTH ROLLING AVG (W/ DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	Natural Gas	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total (TPM)	PUC QUALITY NATURAL GAS	12	LB/H	12-MONTH ROLLING AVG (NO DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	Natural Gas	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total 2.5µ (TPM2.5)	PUC QUALITY NATURAL GAS	12	LB/H	12-MONTH ROLLING AVG (NO DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total (TPM)	USE PUC QUALITY NATURAL GAS	18	LB/H	12-MONTH ROLLING AVG (W/ DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Particulate matter, total 2.5µ (TPM2.5)	PUC QUALITY NATURAL GAS	18	LB/H	12-MONTH ROLLING AVG (W/ DUCT BURNING)
WEST DEPTFORD ENERGY	LS POWER	NJ	Douglus Mulvey	5/6/2009	A NEW POWER GENERATING FACILITY TO BE BUILT IN WEST DEPTFORD. IT IS A PSD, LAER AND TITLE V FACILITY.	NEW 600 MW COMBINED CYCLE POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	17,298	MMFT3/YR		Particulate matter, filterable 10µ (FPM10)	CLEAN FUELS - NATURAL GAS AND ULTRA LOW SULFUR (15PPM SULFUR) DISTILLATE OIL	18.66	LB/H	
WEST DEPTFORD ENERGY	LS POWER	NJ	Douglus Mulvey	5/6/2009	A NEW POWER GENERATING FACILITY TO BE BUILT IN WEST DEPTFORD. IT IS A PSD, LAER AND TITLE V FACILITY.	NEW 600 MW COMBINED CYCLE POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	17,298	MMFT3/YR		Particulate matter, filterable 2.5µ (FPM2.5)	USE OF CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL	18.66	LB/H	
CHOUTEAU POWER PLANT	ASSOCIATED ELECTRIC COOPERATIVE INC	OK		1/23/2009			COMBINED CYCLE COGENERATION >25MW	15.21	NATURAL GAS	1,882	MMBTU/H	SIEMENS V84.3A	Particulate matter, total 10µ (TPM10)	NATURAL GAS FUEL	6.59	LB/H	3-H AVG
CPV ST CHARLES	COMPETITIVE POWER VENTURES, INC./CPV MARYLAND, LLC	MD	Sharon K Segner	11/12/2008	640 MW GENERATING FACILITY		COMBUSTION TURBINES (2)	15.21	NATURAL GAS			GENERAL ELECTRIC 207FA COMBUSTION TURBINE WITH HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT FIRING CAPABILIY (DUCT BURNER EQUIPPED WITH LNB). EACH CT IS CAPABLE OF GENERATING A NOMINAL 176 MW OF ELECTRICITY. THE STEAM TURBINE IS CAPABLE OF GENERATING 304 MW OF ELECTRICITY. OVERALL FACILITY NOMINAL GENERATION CAPACITY OF 640 MW	Particulate matter, filterable 10µ (FPM10)		0.012	LB/MMBTU @ 15% O2	3-HR AVERAGE
CPV ST CHARLES	COMPETITIVE POWER VENTURES, INC./CPV MARYLAND, LLC	MD	Sharon K Segner	11/12/2008	640 MW GENERATING FACILITY		COMBUSTION TURBINES (2)	15.21	NATURAL GAS			GENERAL ELECTRIC 207FA COMBUSTION TURBINE WITH HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT FIRING CAPABILIY (DUCT BURNER EQUIPPED WITH LNB). EACH CT IS CAPABLE OF GENERATING A NOMINAL 176 MW OF ELECTRICITY. THE STEAM TURBINE IS CAPABLE OF GENERATING 304 MW OF ELECTRICITY. OVERALL FACILITY NOMINAL GENERATION CAPACITY OF 640 MW	Particulate matter, filterable 2.5µ (FPM2.5)		0.012	LB/MMBTU @ 15% O2	3-HR AVERAGE

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MORRO BAY POWER PLANT	DYNERGY MORRO BAY LLC	CA	Steve Goschke	9/25/2008	POWER PLANT	PSD permit is for a modernization Project which consists of replacing four existing 1950/1960-era fossil-fuel-fired electric utility steam generators (1002 megawatt [MW] total) with two combined cycle gas turbine block units. Each new block unit will be capable of producing 600 MW. Each new block unit will consist of two GE Frame 7, Model PG7241, 180 MW gas-fired turbines, two HRSGs with duct burners, and one 240 MW steam turbine. The modernization project also includes, in part, demolition of the existing fuel oil tank farm, demolition of three existing 450-foot exhaust stacks, installation of two new 145-foot exhaust stacks, and refurbishment of the sea-water cooling intake structure.	COMBUSTION TURBINE GENERATOR	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PIPELINE QUALITY NATURAL GAS, OPERATE DUCT BURNERS NO MORE THAN 4000 HRS PER YEAR (12-MONTH ROLLING AVG BASIS)	11	LB/H	6-HR ROLLING AVG (NO DUCT BURNING)
MORRO BAY POWER PLANT	DYNERGY MORRO BAY LLC	CA	Steve Goschke	9/25/2008	POWER PLANT	PSD permit is for a modernization Project which consists of replacing four existing 1950/1960-era fossil-fuel-fired electric utility steam generators (1002 megawatt [MW] total) with two combined cycle gas turbine block units. Each new block unit will be capable of producing 600 MW. Each new block unit will consist of two GE Frame 7, Model PG7241, 180 MW gas-fired turbines, two HRSGs with duct burners, and one 240 MW steam turbine. The modernization project also includes, in part, demolition of the existing fuel oil tank farm, demolition of three existing 450-foot exhaust stacks, installation of two new 145-foot exhaust stacks, and refurbishment of the sea-water cooling intake structure.	COMBUSTION TURBINE GENERATOR	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PIPELINE QUALITY NATURAL GAS, OPERATE DUCT BURNERS NO MORE THAN 4000 HRS PER YEAR (12-MONTH ROLLING AVG BASIS)	11	LB/H	6-HR ROLLING AVG (NO DUCT BURNING)
MORRO BAY POWER PLANT	DYNERGY MORRO BAY LLC	CA	Steve Goschke	9/25/2008	POWER PLANT	PSD permit is for a modernization Project which consists of replacing four existing 1950/1960-era fossil-fuel-fired electric utility steam generators (1002 megawatt [MW] total) with two combined cycle gas turbine block units. Each new block unit will be capable of producing 600 MW. Each new block unit will consist of two GE Frame 7, Model PG7241, 180 MW gas-fired turbines, two HRSGs with duct burners, and one 240 MW steam turbine. The modernization project also includes, in part, demolition of the existing fuel oil tank farm, demolition of three existing 450-foot exhaust stacks, installation of two new 145-foot exhaust stacks, and refurbishment of the sea-water cooling intake structure.	COMBUSTION TURBINE GENERATOR	15.21	NATURAL GAS	180	MW		Particulate matter, total (TPM)	USE PIPELINE QUALITY NATURAL GAS, OPERATE DUCT BURNERS NO MORE THAN 4000 HRS PER YEAR (12-MONTH ROLLING AVG BASIS)	11	LB/H	6-HR ROLLING AVG (NO DUCT BURNING)
MORRO BAY POWER PLANT	DYNERGY MORRO BAY LLC	CA	Steve Goschke	9/25/2008	POWER PLANT	PSD permit is for a modernization Project which consists of replacing four existing 1950/1960-era fossil-fuel-fired electric utility steam generators (1002 megawatt [MW] total) with two combined cycle gas turbine block units. Each new block unit will be capable of producing 600 MW. Each new block unit will consist of two GE Frame 7, Model PG7241, 180 MW gas-fired turbines, two HRSGs with duct burners, and one 240 MW steam turbine. The modernization project also includes, in part, demolition of the existing fuel oil tank farm, demolition of three existing 450-foot exhaust stacks, installation of two new 145-foot exhaust stacks, and refurbishment of the sea-water cooling intake structure.	COMBUSTION TURBINE GENERATOR	15.21	NATURAL GAS	180	MW		Particulate matter, total 10µ (TPM10)	USE PIPELINE QUALITY NATURAL GAS, OPERATE DUCT BURNERS NO MORE THAN 4000 HRS PER YEAR (12-MONTH ROLLING AVG BASIS)	11	LB/H	6-HR ROLLING AVG (NO DUCT BURNING)

Table C-1. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CANE ISLAND POWER PARK	FLORIDA MUNICIPAL POWER AGENCY (FMPA	FL	Roger Fontes	9/8/2008	FMPA AND THE KISSIMMEE UTILITIES AUTHORITY (KUA) JOINTLY OWN THE CIPP, WHICH IS LOCATED IN OSCEOLA COUNTY AT 6075 OLD TAMPA HIGHWAY, INTERCESSION CITY, FLORIDA. THE CIPP PRESENTLY CONSISTS OF ONE 40 MEGAWATT (MW) SIMPLE CYCLE COMBUSTION TURBINE (UNIT 1), A 120 MW COMBINED CYCLE UNIT INCLUDING A HEAT RECOVERY STEAM GENERATOR (HRSG) (UNIT 2) AND A 250 MW COMBINED CYCLE UNIT (UNIT 3). THE THREE EXISTING UNITS FIRE NATURAL GAS AS THE PRIMARY FUEL, WITH DISTILLATE FUEL AS BACKUP. THE NEW UNIT WILL BE A NATURAL GAS 300 MW COMBINED CYCLE UNIT AND ASSOCIATED EQUIPMENT.	THE PROJECT WILL BE A¿ONE-ON-ONE¿ 300 MW NATURAL GAS-FUELED COMBINED CYCLE UNIT (CIPP UNIT 4) AND ASSOCIATED AUXILIARY EQUIPMENT. UNIT 4 AND ASSOCIATED AUXILIARY EQUIPMENT WILL CONSIST OF: ¿ A NOMINAL 150 MW GAS-FUELED GENERAL ELECTRIC 7241 FA CTG; ¿ A SUPPLEMENTARY-FIRED HRSG WITH NATURAL GAS FUELED DUCT BURNERS (DB); ¿ A NOMINAL 150 MW STG; ¿ A NOMINAL 160-FOOT STACK; ¿ AN EMERGENCY DIESEL ENGINE FIRE PUMP AND SMALL ULTRALOW SULFUR DIESEL (ULSD) FUEL OIL (FO)STORAGE TANK; ¿ A NOMINAL 750 KILOWATTS (KW) SAFE SHUTDOWN DIESEL GENERATOR WITH A ULSD FO STORAGE TANK; AND ¿ A MECHANICAL DRAFT COOLING TOWER WITH DRIFT ELIMINATORS.	300 MW COMBINED CYCLE COMBUSTION TURBINE	15.21	NATURAL GAS	1,860	MMBTU/H		Particulate matter, total 10µ (TPM10)	FUEL SPECIFICATIONS : 2 GR S/100 SCF OF GAS	2	GR S/100 SCF GAS	
PLAQUEMINE COGENERATION FACILITY	THE DOW CHEMICAL COMPANY	LA	Kris Gaus	7/23/2008	STEAM AND POWER GENERATION FACILITY COMPRISED OF FOUR NATURAL GAS FIRED GE FRAME 7 FA GAS TURBINES, EACH WITH A NOMINAL POWER RATING OF 170 MW, EACH EQUIPPED WITH DRY LOW NOX COMBUSTORS AND STEAM INJECTION CAPABILITIES, HEAT RECOVERY STEAM GENERATOR (HRSG), SUPPLEMENTARY FIRED DUCT BURNER SYSTEM, SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM.	LOCATED WITHIN THE DOW CHEMICAL COMPANY'S LOUISIANA OPERATIONS COMPLEX. PSD-LA-659(M-1), ISSUED 10/3/03, REVISED LB/HR & TPY LIMITS ASSOCIATED WITH THE COOLING TOWER. THE UPDATED RATES ARE REFLECTED HEREIN. PSD-LA-659(M-1), ISSUED JULY 23, 2008 REVISE THE MAXIMUM NOX EMISSIONS TO 240 LBS/HR AND INCLUDE MAXIMUM NOX EMISSIONS DURING STARTUPS AND SHUTDOWNS AS 480 LBS/HR	(4) GAS TURBINES/DUCT BURNERS	15.21	NATURAL GAS	2,876	MMBTU/H	VISUAL INSPECTION FOR OPACITY ON A WEEKLY BASIS, STACK TESTS FOR PM, NOX, SO2, OPACITY, CO EMISSION POINTS GT-500, -600, -700, -800.	Particulate matter, filterable 10µ (FPM10)	USE OF CLEAN BURNING FUELS	33.5	LB/H	HOURLY MAXIMUM
KLEEN ENERGY SYSTEMS, LLC	KLEEN ENERGY SYSTEMS, LLC	CT	Jason Farren	2/25/2008	580 MW NOMINAL (620 MW PEAK) BASE LOAD NATURAL GAS FIRED POWER PLANT WITH NO.2 OIL BACKUP. TWO SIEMENS SGT6-5000F COMBUSTION TURBINE TRAINS WITH HRSG AND NATURAL GAS DUCT BURNER.	FACILITY CONSISTS OF TWO TURBINE TRAINS. EACH TURBINE TRAIN CONSISTS OF A SIEMENS SGT6-5000F COMBUSTION TURBINE WITH NATURAL GAS AS PRIMARY AND OIL AS BACKUP, A 445 MMBTU/HR NATURAL GAS ONLY DUCT BURNER AND AN HRSG. CONTROL EQUIPMENT ON EACH TRAIN CONSISTS OF AN SCR AND CO CATALYST. EMISSION RATES PRESENTED WITHIN ARE FOR EACH TURINE TRAIN INDIVIDUALLY. SHORT -TERM EMISSION RATES ARE REPRESENTATIVE OF STEADY STATE OPERATION. TRANSIENT OPERATION (START-UP, SHUT DOWN, ETC) SHORT-TERM EMISSION RATES ARE INCLUDED IN THE PERMITS FACILITY-WIDE EMISSIONS ARE REPRESENTATIVE OF EMISSIONS FROM EACH TURBINE TRAIN ONLY AND INCLUDE EMISSIONS FROM TRANSIENT OPERATIONS.	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	15.21	NATURAL GAS	2.1	MMCF/H	THROUGHPUT IS FOR TURBINE ONLY WHEN FIRING NATURAL GAS TURBINE: 2136 MMBTU/HR (2.095 MMCF/HR) DUCT BURNER: 445 MMBTU/HR (0.436 MMCF/HR) EMISSION RATES ARE FOR EACH COMBUSTION TURBINE FIRING NATURAL GAS, NOT COMBINED.	Particulate matter, filterable 10µ (FPM10)		11	LB/H	W/OUT DUCT BURNER

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 CO - Simple-Cycle Combustion Turbine 1 (Commissioning) [SCN0005]	15.11	Natural Gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 CO - Simple-Cycle Combustion Turbine 1 (Commissioning) [SCN0005]	15.11	Natural Gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 CO - Simple-Cycle Combustion Turbine 2 (Commissioning) [SCN0006]	15.11	natural gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 CO - Simple-Cycle Combustion Turbine 2 (Commissioning) [SCN0006]	15.11	natural gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 SUSD - Simple-Cycle Combustion Turbine 1 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0019]	15.11	Natural Gas	2,201	MM BTU/hR	Limited to 600 hr/yr	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 SUSD - Simple-Cycle Combustion Turbine 1 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0019]	15.11	Natural Gas	2,201	MM BTU/hR	Limited to 600 hr/yr	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 SUSD - Simple-Cycle Combustion Turbine 2 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0020]	15.11	Natural Gas	2,201	MM BTU/hr	limited to 600 hr/yr	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 SUSD - Simple-Cycle Combustion Turbine 2 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0020]	15.11	Natural Gas	2,201	MM BTU/hr	limited to 600 hr/yr	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 NO - Simple-Cycle Combustion Turbine 1 (Normal Operations) [EQT0017]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hrs/yr	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 NO - Simple-Cycle Combustion Turbine 1 (Normal Operations) [EQT0017]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hrs/yr	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices & use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 NO - Simple-Cycle Combustion Turbine 2 (Normal Operations) [EQT0018]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hours per year	Particulate matter, total 10µ (TPM10)	Good combustion practices and the use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 NO - Simple-Cycle Combustion Turbine 2 (Normal Operations) [EQT0018]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hours per year	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices & use of low sulfur fuels (pipeline quality natural gas)	6.3	LB/HR	HOULY MAXIMUM
WAVERLY POWER PLANT	PLEASANTS ENERGY LLC	WV	Gerald Gatti	3/13/2018	300 MW Simple-Cycle Peaking Plant	Modification to existing PSD Permit (R14-0034, RBLC Number WV-0027) to add advanced gas path technology to the turbines that was defined as a change in the method of operation that resulted a major modification to the turbines.	GE 7FA.004 Turbine	15.11	Natural Gas	167.8	MW	This one entry is for both turbines as they are the same. Each turbine, after this modification, is a nominal 167.8 MW GE Model 7FA.004. Has oil-fire backup.	Particulate matter, total 2.5µ (TPM2.5)	Inlet air filtration.	15.09	LB/HR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines	15.11	natural gas	920	MW	4 identical units, each limited to 2500 hours of operation per year	Particulate matter, filterable (FPM)	Use of pipeline quality natural gas and good combustion practices.	11.81	TON/YR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines	15.11	natural gas	920	MW	4 identical units, each limited to 2500 hours of operation per year	Particulate matter, total 10µ (TPM10)	Use of pipeline quality natural gas and good combustion practices.	11.81	TON/YR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines	15.11	natural gas	920	MW	4 identical units, each limited to 2500 hours of operation per year	Particulate matter, total 2.5µ (TPM2.5)	Use of pipeline quality natural gas and good combustion practices.	11.81	TON/YR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines MSS	15.11	NATURAL GAS				Particulate matter, total (TPM)	Minimizing duration of startup/shutdown, using good air pollution control practices and safe operating practices.	0.01	TON/YR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines MSS	15.11	NATURAL GAS				Particulate matter, total 10µ (TPM10)	Minimizing duration of startup/shutdown, using good air pollution control practices and safe operating practices.	0.01	TON/YR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines MSS	15.11	NATURAL GAS				Particulate matter, total 2.5µ (TPM2.5)	Minimizing duration of startup/shutdown, using good air pollution control practices and safe operating practices.	0.01	TON/YR	
MUSTANG STATION	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jeff Pippin	8/16/2017	GE7FA combustion turbine (Unit 6) to increase the hours of operation to 3000 hours per year. The turbine construction was completed the first quarter of 2013 and initial firing began on April 1, 2013.		Simple Cycle Turbine	15.11	NATURAL GAS	162.8	MW	Unit 6 Turbine is limited to 3000 hours per year.	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas and good combustion practices	27	T/YR	
MUSTANG STATION	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jeff Pippin	8/16/2017	GE7FA combustion turbine (Unit 6) to increase the hours of operation to 3000 hours per year. The turbine construction was completed the first quarter of 2013 and initial firing began on April 1, 2013.		Simple Cycle Turbine	15.11	NATURAL GAS	162.8	MW	Unit 6 Turbine is limited to 3000 hours per year.	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas and good combustion practices	27	T/YR	
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	227.5	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Particulate matter, total (TPM)	Pipeline quality natural gas; limited hours; good combustion practices	8.5	T/YR	
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	227.5	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas; limited hours; good combustion practices	8.5	T/YR	
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	227.5	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas; limited hours; good combustion practices	8.5	T/YR	
VERMILLION GENERATING STATION	DUKE ENERGY INDIANA, LLC VERMILLION GENERATING STA	IN	Patrick Coughlin	2/28/2017	ELECTRIC UTILITY SERVICES		SIMPLE CYCLE, NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	80	MW		Particulate matter, filterable (FPM)	GOOD COMBUSTION PRACTICES	5	LB/H	EACH TURBINE

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
VERMILLION GENERATING STATION	DUKE ENERGY INDIANA, LLC VERMILLION GENERATING STA	IN	Patrick Coughlin	2/28/2017	ELECTRIC UTILITY SERVICES		SIMPLE CYCLE, NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	80	MW		Particulate matter, filterable 10µ (FPM10)	GOOD COMBUSTION PRACTICES	5	LB/H	EACH TURBINE
VERMILLION GENERATING STATION	DUKE ENERGY INDIANA, LLC VERMILLION GENERATING STA	IN	Patrick Coughlin	2/28/2017	ELECTRIC UTILITY SERVICES		SIMPLE CYCLE, NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	80	MW		Particulate matter, total 2.5µ (TPM2.5)	GOOD COMBUSTION PRACTICES	5	LB/H	EACH TURBINE
CAMERON LNG FACILITY	CAMERON LNG LLC	LA	Clayton Miller	2/17/2017	a facility to liquefy natural gas for export (5 trains)	Permit PSD-LA-766, dated 10/1/13 for liquefaction trains 1,2, and 3 Permit PSD-LA-766(M1), dated 6/26/14, for minor changes; Permit PSD-LA-766(M2), dated 3/3/16, for train 4 and 5	Gas turbines (9 units)	15.11	natural gas	1,069	mm btu/hr		Particulate matter, total 10µ (TPM10)	good combustion practices and fueled by natural gas	0.0076	LB/MM BTU	THREE ONE-HOUR TEST AVERAGE
CAMERON LNG FACILITY	CAMERON LNG LLC	LA	Clayton Miller	2/17/2017	a facility to liquefy natural gas for export (5 trains)	Permit PSD-LA-766, dated 10/1/13 for liquefaction trains 1,2, and 3 Permit PSD-LA-766(M1), dated 6/26/14, for minor changes; Permit PSD-LA-766(M2), dated 3/3/16, for train 4 and 5	Gas turbines (9 units)	15.11	natural gas	1,069	mm btu/hr		Particulate matter, total 2.5µ (TPM2.5)	good combustion practices and fueled by natural gas	0.0076	LB/MM BTU	THREE ONE-HOUR TEST AVERAGE
CORPUS CHRISTI LIQUEFACTION	CORPUS CHRISTI LIQUEFACTION STAGE III, LLC	TX	Keith Little	2/14/2017	Trains 4 and 5 will consist of 12 natural gas compressor turbines, 2 thermal oxidizers, 2 sets of flares each comprised of one wet gas flare and one dry gas flare, 2 amine surge tanks (maintenance, startup, and shutdown [MSS] only), 3 diesel generators, 3 fire-water pump diesel engines, 6 fixed roof diesel storage tanks, and piping components.		Refrigeration compressor turbines	15.11	NATURAL GAS	40,000	HP	2 liquefied natural gas trains consisting of a total of (12) GE LM2500+ DLE turbines drive the propane, ethylene, and methane section compressors.	Particulate matter, total 2.5µ (TPM2.5)		0.75	LB/H	
WAVERLY FACILITY	PLEASANTS ENERGY, LLC	WV	Gerald Gatti	1/23/2017	300 MW, natural gas fired, simple cycle peaking power facility	In this permitting action PSD only applies to the modified combustion turbines based on the relaxation of an original synthetic minor permit issued in 1999. Project also involves previous installation of turbo-charging. All BACT emission limits are given without turbocharging and startup/shutdown emissions are not included. Please contact above engineer for more information. There are two identical turbines but only one is listed.	GE Model 7FA Turbine	15.11	Natural Gas	1,571	mmbtu/hr	There are two identical units at the facility.	Particulate matter, total 2.5µ (TPM2.5)	Inlet Air Filtration, Use of Natural Gas, Ultra-Low Sulfur Diesel	15	LB/HR	NATURAL GAS
MONTPELIER GENERATING STATION	AES OHIO GENERATION, LLC	IN	Drew Parker	1/6/2017	COMBUSTION TURBINES		PRATT & TWIN-PAC SIMPLE CYCLE TURBINES	15.11	NATURAL GAS	270.9	MMBTU/H	NO. 2 DIESEL OIL BACKUP FUEL	Particulate matter, filterable 10µ (FPM10)	USE NATURAL GAS AS PRIMARY FUEL; GOOD COMBUSTION PRACTICES	0.0066	LB/MMBTU	3-HR AVG FOR NATURAL GAS
MONTPELIER GENERATING STATION	AES OHIO GENERATION, LLC	IN	Drew Parker	1/6/2017	COMBUSTION TURBINES		PRATT & TWIN-PAC SIMPLE CYCLE TURBINES	15.11	NATURAL GAS	270.9	MMBTU/H	NO. 2 DIESEL OIL BACKUP FUEL	Particulate matter, total 2.5µ (TPM2.5)	NATURAL GAS PRIMARY FUEL; GOOD COMBUSTION PRACTICES	0.0066	LB/MMBTU	3-HR AVG FOR NATURAL GAS
INVENERGY NELSON EXPANSION LLC	INVENERGY	IL	Gordon Gray	9/27/2016	Peaking facility at an existing major source. The expansion will consist of two simple cycle combustion turbines and a fuel heater.		Two Simple Cycle Combustion Turbines	15.11	Natural Gas	190	MW	Two simple cycle combustion turbines used for peaking purposes and fired primarily on natural gas with ULSD as a secondary fuel.	Particulate matter, filterable (FPM)	turbine design and good combustion practices	0.0038	LB/MMBTU	3-HOUR BLOCK AVERAGE
INVENERGY NELSON EXPANSION LLC	INVENERGY	IL	Gordon Gray	9/27/2016	Peaking facility at an existing major source. The expansion will consist of two simple cycle combustion turbines and a fuel heater.		Two Simple Cycle Combustion Turbines	15.11	Natural Gas	190	MW	Two simple cycle combustion turbines used for peaking purposes and fired primarily on natural gas with ULSD as a secondary fuel.	Particulate matter, total 10µ (TPM10)	turbine design and good combustion practices	0.005	LB/MMBTU	3-HOUR BLOCK AVERAGE
INVENERGY NELSON EXPANSION LLC	INVENERGY	IL	Gordon Gray	9/27/2016	Peaking facility at an existing major source. The expansion will consist of two simple cycle combustion turbines and a fuel heater.		Two Simple Cycle Combustion Turbines	15.11	Natural Gas	190	MW	Two simple cycle combustion turbines used for peaking purposes and fired primarily on natural gas with ULSD as a secondary fuel.	Particulate matter, total 2.5µ (TPM2.5)	turbine design and good combustion practices	0.005	LB/MMBTU	3-HOUR BLOCK AVERAGE
BAYONNNE ENERGY CENTER	BAYONNNE ENERGY CENTER LLC	NJ	Ellen Allman	8/26/2016	Facility consists of 8 existing Roll Royce Trent 60 WLE (64 MW) each. The facility is adding two more new Roll Royce Trent 60 WLE (66 MW) each	The facility has eight existing simple cycle combustion turbines Rolls Royce Trent turbine 64 MW each. This permit allows the construction and operation of two more Rolls Royce Trent (WLE) simple cycle combustion turbines 66 MW each. The turbines will be dual fired, with natural gas as primary fuel and ultra low sulfur distillate oil with less than or equal to 15% sulfur by weight. The turbines will have SCR and Oxidation catalyst for removal of NOx, CO and VOC.	Simple Cycle Stationary Turbines firing Natural gas	15.11	Natural Gas	2,143,980	MMBTU/YR	The Siemens/Rolls Royce Trent 60 wet low emissions (WLE) combustion turbine generators (CTGs) will each have a maximum heat input rate while combusting natural gas of 643 million British thermal units per hour (MMBtu/hr) (higher heating value [HHV]) at 100 percent (%) load, at International Organization for Standardization (ISO) conditions of 59 degrees Fahrenheit (°F) and 60% relative humidity, generating 66 MW. The maximum heat input rate on ULSD at ISO condition would be 533.50 MMBtu/hr (HHV). Each of the CTG will be equipped with Water Injection and Selective Catalytic Reduction System (SCR) to control Nitrogen Oxide (NOx) emissions and Oxidation Catalyst to control Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) emissions. The CTGs will have continuous emissions monitoring systems (CEMs) for NOx and CO.	Particulate matter, filterable (FPM)	Use of Natural gas a clean burning fuel	5	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
BAYONNNE ENERGY CENTER	BAYONNNE ENERGY CENTER LLC	NJ	Ellen Allman	8/26/2016	Facility consists of 8 existing Roll Royce Trent 60 WLE (64 MW) each. The facility is adding two more new Roll Royce Trent 60 WLE (66 MW) each	The facility has eight existing simple cycle combustion turbines Rolls Royce Trent turbine 64 MW each. This permit allows the construction and operation of two more Rolls Royce Trent (WLE) simple cycle combustion turbines 66 MW each. The turbines will be dual fired, with natural gas as primary fuel and ultra low sulfur distillate oil with less than or equal to 15% sulfur by weight. The turbines will have SCR and Oxidation catalyst for removal of NOx, CO and VOC.	Simple Cycle Stationary Turbines firing Natural gas	15.11	Natural Gas	2,143,980	MMBTU/YR	The Siemens/Rolls Royce Trent 60 wet low emissions (WLE) combustion turbine generators (CTGs) will each have a maximum heat input rate while combusting natural gas of 643 million British thermal units per hour (MMBtu/hr) (higher heating value [HHV]) at 100 percent (%) load, at International Organization for Standardization (ISO) conditions of 59 degrees Fahrenheit (°F) and 60% relative humidity, generating 66 MW. The maximum heat input rate on ULSD at ISO condition would be 533.50 MMBtu/hr (HHV). Each of the CTG will be equipped with Water Injection and Selective Catalytic Reduction System (SCR) to control Nitrogen Oxide (NOx) emissions and Oxidation Catalyst to control Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) emissions. The CTGs will have continuous emissions monitoring systems (CEMs) for NOx and CO.	Particulate matter, total 10µ (TPM10)	Use of Natural gas a clean burning fuel	5	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
BAYONNNE ENERGY CENTER	BAYONNNE ENERGY CENTER LLC	NJ	Ellen Allman	8/26/2016	Facility consists of 8 existing Roll Royce Trent 60 WLE (64 MW) each. The facility is adding two more new Roll Royce Trent 60 WLE (66 MW) each	The facility has eight existing simple cycle combustion turbines Rolls Royce Trent turbine 64 MW each. This permit allows the construction and operation of two more Rolls Royce Trent (WLE) simple cycle combustion turbines 66 MW each. The turbines will be dual fired, with natural gas as primary fuel and ultra low sulfur distillate oil with less than or equal to 15% sulfur by weight. The turbines will have SCR and Oxidation catalyst for removal of NOx, CO and VOC.	Simple Cycle Stationary Turbines firing Natural gas	15.11	Natural Gas	2,143,980	MMBTU/YR	The Siemens/Rolls Royce Trent 60 wet low emissions (WLE) combustion turbine generators (CTGs) will each have a maximum heat input rate while combusting natural gas of 643 million British thermal units per hour (MMBtu/hr) (higher heating value [HHV]) at 100 percent (%) load, at International Organization for Standardization (ISO) conditions of 59 degrees Fahrenheit (°F) and 60% relative humidity, generating 66 MW. The maximum heat input rate on ULSD at ISO condition would be 533.50 MMBtu/hr (HHV). Each of the CTG will be equipped with Water Injection and Selective Catalytic Reduction System (SCR) to control Nitrogen Oxide (NOx) emissions and Oxidation Catalyst to control Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) emissions. The CTGs will have continuous emissions monitoring systems (CEMs) for NOx and CO.	Particulate matter, total 2.5µ (TPM2.5)	Use of natural gas a clean burning fuel	5	LB/H	AV OF THREE ONE H STACK TESTS EVERY 5 YR
HILL COUNTY GENERATING FACILITY	BRAZOS ELECTRIC COOPERATIVE	TX	Mike Meyers	4/7/2016	Four simple cycle combustion turbine electric generators are proposed. Natural gas or ultra-low sulfur diesel fuel oil are the fuels. Turbine model options are: General Electric (GE) 7FA.03, GE 7FA.04, GE 7FA.05, and Siemens SGT6-5000(5)ee. Electric output is between 684 and 928 megawatts (MW).		Simple cycle turbine	15.11	natural gas	171	MW	Each combustion turbine is limited to 2,920 hours of annual operation, including startup and shutdown hours.	Particulate matter, total 10µ (TPM10)	Premixing of fuel and air enhances combustion efficiency and minimizes emissions.	14	LB/H	
HILL COUNTY GENERATING FACILITY	BRAZOS ELECTRIC COOPERATIVE	TX	Mike Meyers	4/7/2016	Four simple cycle combustion turbine electric generators are proposed. Natural gas or ultra-low sulfur diesel fuel oil are the fuels. Turbine model options are: General Electric (GE) 7FA.03, GE 7FA.04, GE 7FA.05, and Siemens SGT6-5000(5)ee. Electric output is between 684 and 928 megawatts (MW).		Simple cycle turbine	15.11	natural gas	171	MW	Each combustion turbine is limited to 2,920 hours of annual operation, including startup and shutdown hours.	Particulate matter, total 2.5µ (TPM2.5)	Premixing of fuel and air enhances combustion efficiency and minimizes emissions.	14	LB/H	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines > 25 MW	15.11	natural gas	232	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Particulate matter, total 10µ (TPM10)	good combustion practices, low sulfur fuel	13.4	LB/H	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines > 25 MW	15.11	natural gas	232	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Particulate matter, total 2.5µ (TPM2.5)	good combustion practices, low sulfur fuel	13.4	LB/H	
MAGNOLIA LNG FACILITY	MAGNOLIA LNG, LLC	LA	Komi Hassan	3/21/2016	A new facility to liquefy 8.0 million metric tons per year of natural gas		Gas Turbines (8 units)	15.11	natural gas	333	mm btu/hr		Particulate matter, total 10µ (TPM10)	good combustion practices and fueled by natural gas			
MAGNOLIA LNG FACILITY	MAGNOLIA LNG, LLC	LA	Komi Hassan	3/21/2016	A new facility to liquefy 8.0 million metric tons per year of natural gas		Gas Turbines (8 units)	15.11	natural gas	333	mm btu/hr		Particulate matter, filterable 2.5µ (FPM2.5)	good combustion practices and fueled by natural gas			
PORT ARTHUR LNG EXPORT TERMINAL	PORT ARTHUR LNG, LLC	TX	J.D. Morris	2/17/2016	Liquefied natural gas (LNG) export terminal		Simple Cycle Electrical Generation Gas Turbines 15.210	15.11	natural gas	34	MW	Nine GE PGT25+G4 gas turbines for electrical generation at the site at 34 MW/turbine	Particulate matter, total 10µ (TPM10)	Equipment specifications & work practices - Good combustion practices and use of low carbon, low sulfur fuel	2.32	LB/H	
PORT ARTHUR LNG EXPORT TERMINAL	PORT ARTHUR LNG, LLC	TX	J.D. Morris	2/17/2016	Liquefied natural gas (LNG) export terminal		Simple Cycle Electrical Generation Gas Turbines 15.210	15.11	natural gas	34	MW	Nine GE PGT25+G4 gas turbines for electrical generation at the site at 34 MW/turbine	Particulate matter, total 2.5µ (TPM2.5)	Equipment specifications & work practices - Good combustion practices and use of low carbon, low sulfur fuel	2.32	LB/H	

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
UNION VALLEY ENERGY CENTER	NAVASOTA SOUTH PEAKERS OPERATING COMPANY I, LLC.	TX	Bill Skinner	12/9/2015	three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 megawatt (MW) each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Particulate matter, total 10µ (TPM10)	pipeline quality natural gas, good combustion practices	8.6	LB/H	
UNION VALLEY ENERGY CENTER	NAVASOTA SOUTH PEAKERS OPERATING COMPANY I, LLC.	TX	Bill Skinner	12/9/2015	three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 megawatt (MW) each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Particulate matter, total 2.5µ (TPM2.5)	pipeline quality natural gas, good combustion practices	8.6	LB/H	
VAN ALSTYNE ENERGY CENTER (VAEC)	NAVASOTA NORTH COUNTRY PEAKERS OPERATING COMPANY I	TX	Bill Skinner	10/27/2015	Navasota North Country Peakers Operating Company I LLC. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 MW each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Particulate matter, total 10µ (TPM10)	Pipeline Quality Natural Gas	8.6	LB/H	
VAN ALSTYNE ENERGY CENTER (VAEC)	NAVASOTA NORTH COUNTRY PEAKERS OPERATING COMPANY I	TX	Bill Skinner	10/27/2015	Navasota North Country Peakers Operating Company I LLC. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 MW each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Particulate matter, total 2.5µ (TPM2.5)	Pipeline Quality Natural Gas	8.6	LB/H	
NACOGDOCHES POWER ELECTRIC GENERATING PLANT	NACOGDOCHES POWER, LLC	TX	Kelli Mccullough	10/14/2015	Nacogdoches Power, LLC is requesting authorization for one natural gas fired, simple cycle combustion turbine generator (CTG). The CTG will be a Siemens F5 and have a nominal electric output of 232 megawatts (MW).		Natural Gas Simple Cycle Turbine (>25 MW)	15.11	natural gas	232	MW	One Siemens F5 simple cycle combustion turbine generator	Particulate matter, total (TPM)	Pipeline quality natural gas; limited hours; good combustion practices.	12.09	LB/HR	
NACOGDOCHES POWER ELECTRIC GENERATING PLANT	NACOGDOCHES POWER, LLC	TX	Kelli Mccullough	10/14/2015	Nacogdoches Power, LLC is requesting authorization for one natural gas fired, simple cycle combustion turbine generator (CTG). The CTG will be a Siemens F5 and have a nominal electric output of 232 megawatts (MW).		Natural Gas Simple Cycle Turbine (>25 MW)	15.11	natural gas	232	MW	One Siemens F5 simple cycle combustion turbine generator	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas; limited hours; good combustion practices.	12.09	LB/HR	
NACOGDOCHES POWER ELECTRIC GENERATING PLANT	NACOGDOCHES POWER, LLC	TX	Kelli Mccullough	10/14/2015	Nacogdoches Power, LLC is requesting authorization for one natural gas fired, simple cycle combustion turbine generator (CTG). The CTG will be a Siemens F5 and have a nominal electric output of 232 megawatts (MW).		Natural Gas Simple Cycle Turbine (>25 MW)	15.11	natural gas	232	MW	One Siemens F5 simple cycle combustion turbine generator	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas; limited hours; good combustion practices.	12.09	LB/HR	
SHAWNEE ENERGY CENTER	SHAWNEE ENERGY CENTER, LLC	TX	Neil O'Donovan	10/9/2015	Electric Generating Utility: The project will consist of four gas fired combustion turbines (CTGs). The CTGs are fueled with pipeline quality natural gas and will operate in simple cycle mode. The gas turbines will be one of two options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	230	MW	Siemens Model SGT6-5000 F5ee " 230 MW or Second turbine option: General Electric Model 7FA.05TP " 227 MW	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas; limited hours; good combustion practices.	84.1	LB/HR	
SHAWNEE ENERGY CENTER	SHAWNEE ENERGY CENTER, LLC	TX	Neil O'Donovan	10/9/2015	Electric Generating Utility: The project will consist of four gas fired combustion turbines (CTGs). The CTGs are fueled with pipeline quality natural gas and will operate in simple cycle mode. The gas turbines will be one of two options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	230	MW	Siemens Model SGT6-5000 F5ee " 230 MW or Second turbine option: General Electric Model 7FA.05TP " 227 MW	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas; limited hours; good combustion practices.	84.1	LB/HR	
FORT MYERS PLANT	FLORIDA POWER & LIGHT (FPL)	FL	John Hampp	9/10/2015	Electric power plant, consists of a 6-on-2 combined-cycle unit (Units 2A through 2F) and two modern simple-cycle combustion turbines. Primary fuel is natural gas. Also includes 12 gas turbines (63 MW each) for peaking, introduced into service in 1974. This project entails decommissioning 10 of the 12 peaking turbines. They will be replaced with two new GE 7F.05 turbines, each with nominal capacity of 200 MW	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0710002.022.AC.D.ZIP	Combustion Turbines	15.11	Natural gas	2,262.4	MMBtu/hr gas	Two GE 7F.05 turbines, approximately 200 MW each. Natural-gas is primary fuel. Permitted 3390 hr/yr of operation, of which no more than 500 hr may be on fuel oil. Dry Low-NOx, with wet injection for oil firing.	Particulate matter, total (TPM)	Use of clean fuels, and annual VE test	2	GR S / 100 SCF GAS	FOR NATURAL GAS
FORT MYERS PLANT	FLORIDA POWER & LIGHT (FPL)	FL	John Hampp	9/10/2015	Electric power plant, consists of a 6-on-2 combined-cycle unit (Units 2A through 2F) and two modern simple-cycle combustion turbines. Primary fuel is natural gas. Also includes 12 gas turbines (63 MW each) for peaking, introduced into service in 1974. This project entails decommissioning 10 of the 12 peaking turbines. They will be replaced with two new GE 7F.05 turbines, each with nominal capacity of 200 MW	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0710002.022.AC.D.ZIP	Combustion Turbines	15.11	Natural gas	2,262.4	MMBtu/hr gas	Two GE 7F.05 turbines, approximately 200 MW each. Natural-gas is primary fuel. Permitted 3390 hr/yr of operation, of which no more than 500 hr may be on fuel oil. Dry Low-NOx, with wet injection for oil firing.	Particulate matter, total 10µ (TPM10)	Use of clean fuels	2	GR S / 100 SCF GAS	FOR NATURAL GAS
FORT MYERS PLANT	FLORIDA POWER & LIGHT (FPL)	FL	John Hampp	9/10/2015	Electric power plant, consists of a 6-on-2 combined-cycle unit (Units 2A through 2F) and two modern simple-cycle combustion turbines. Primary fuel is natural gas. Also includes 12 gas turbines (63 MW each) for peaking, introduced into service in 1974. This project entails decommissioning 10 of the 12 peaking turbines. They will be replaced with two new GE 7F.05 turbines, each with nominal capacity of 200 MW	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0710002.022.AC.D.ZIP	Combustion Turbines	15.11	Natural gas	2,262	MMBtu/hr gas	Two GE 7F.05 turbines, approximately 200 MW each. Natural-gas is primary fuel. Permitted 3390 hr/yr of operation, of which no more than 500 hr may be on fuel oil. Dry Low-NOx, with wet injection for oil firing.	Particulate matter, total 2.5µ (TPM2.5)	Use of clean fuels	2	GR S / 100 SCF GAS	FOR NATURAL GAS

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	8/25/2015	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	Re-affirmed BACT determinations in Permit No. 0110037-011-AC. Also, new GHG BACT determination. Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.013.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,100	MMBtu/hr (approx)	Five simple cycle GE 7F.05 turbines. Max of 3390 hours per year per turbine. Of the 3390 hours per year, up to 500 hour may be on ULSD fuel oil.	Particulate matter, total (TPM)	Clean fuel prevents PM formation	2	GR. S / 100 SCF GAS	FUEL RECORD KEEPING
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	8/25/2015	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	Re-affirmed BACT determinations in Permit No. 0110037-011-AC. Also, new GHG BACT determination. Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.013.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,100	MMBtu/hr (approx)	Five simple cycle GE 7F.05 turbines. Max of 3390 hours per year per turbine. Of the 3390 hours per year, up to 500 hour may be on ULSD fuel oil.	Particulate matter, total 10µ (TPM10)	Clean fuel prevents PM formation	2	GR. S / 100 SCF	FUEL RECORD KEEPING
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	8/25/2015	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	Re-affirmed BACT determinations in Permit No. 0110037-011-AC. Also, new GHG BACT determination. Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.013.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,100	MMBtu/hr (approx)	Five simple cycle GE 7F.05 turbines. Max of 3390 hours per year per turbine. Of the 3390 hours per year, up to 500 hour may be on ULSD fuel oil.	Particulate matter, total 2.5µ (TPM2.5)	Clean fuel prevents PM formation	2	GR. S / 100 SCF	FUEL RECORD KEEPING
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jolly Hayden	5/12/2015	Golden Spread Electric Cooperative, Inc. (GSEC) is requesting authorization for three additional simple cycle electric generating plants at an existing site to meet increased energy demand in the area. The generating equipment consists of three new GE 7F5-Series natural gas-fired combustion turbine generators (CTGs). Each turbine has a maximum electric output of 202 MW.		Simple Cycle Turbine & Generator	15.11	natural gas	202	MW	3 additional GE 7F 5-Series Combustion Turbine Generators	Particulate matter, total 2.5µ (TPM2.5)	Pipeline quality natural gas; limited hours; good combustion practices.			
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jolly Hayden	5/12/2015	Golden Spread Electric Cooperative, Inc. (GSEC) is requesting authorization for three additional simple cycle electric generating plants at an existing site to meet increased energy demand in the area. The generating equipment consists of three new GE 7F5-Series natural gas-fired combustion turbine generators (CTGs). Each turbine has a maximum electric output of 202 MW.		Simple Cycle Turbine & Generator	15.11	natural gas	202	MW	3 additional GE 7F 5-Series Combustion Turbine Generators	Particulate matter, total 10µ (TPM10)	Pipeline quality natural gas; limited hours; good combustion practices.			
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jolly Hayden	5/12/2015	Golden Spread Electric Cooperative, Inc. (GSEC) is requesting authorization for three additional simple cycle electric generating plants at an existing site to meet increased energy demand in the area. The generating equipment consists of three new GE 7F5-Series natural gas-fired combustion turbine generators (CTGs). Each turbine has a maximum electric output of 202 MW.		Simple Cycle Turbine & Generator	15.11	natural gas	202	MW	3 additional GE 7F 5-Series Combustion Turbine Generators	Particulate matter, total (TPM)	Pipeline quality natural gas; limited hours; good combustion practices.			
INDECK WHARTON ENERGY CENTER	INDECK WHARTON, L.L.C.	TX	James Schneider	2/2/2015	Indeck Wharton, L.L.C. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will either be the General Electric 7FA (~214 MW each) or the Siemens SGT6-5000F (~227 MW each), operating as peaking units in simple cycle mode.		(3) combustion turbines	15.11	natural gas	220	MW	The CTGs will either be the General Electric 7FA (~214 MW each) or the Siemens SGT6-5000F (~227 MW each), operating as peaking units in simple cycle mode	Particulate matter, total 2.5µ (TPM2.5)				
SR BERTRON ELECTRIC GENERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	12/19/2014	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the simple cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The new units will produce between 215-263 MW each.		Simple cycle natural gas turbines	15.11	Natural Gas	225	MW		Particulate matter, filterable 2.5µ (FPM2.5)	Good Combustion Practices, natural gas			
ROANS PRAIRIE GENERATING STATION	TENASKA ROANS PRAIRIE PARTNERS (TRPP), LLC	TX	Larry Carlson	9/22/2014	The proposed project is to construct and operate the RPGS comprised of three new simple cycle combustion turbine generators (CTG), fueled by pipeline quality natural gas. The new CTGs will be peaking units, designed to operate during periods of high electric demand. The three CTGs will produce between 507 and 694 MW of electricity combined, depending on ambient temperature and the model of combustion turbine (CT) selected. The applicant is considering three models of CTs; one model will be selected and the permit revised to reflect the selection before construction begins. The three CT models are: (1) General Electric 7FA.04; (2) General Electric 7FA.05; or (3) Siemens SGT6- 5000F.		(2) simple cycle turbines	15.11	natural gas	600	MW	The three possible CT models are: (1) General Electric 7FA.04; (2) General Electric 7FA.05; or (3) Siemens SGT6- 5000F. will operate 2,920 hours per year at full load for each CT	Particulate matter, total 2.5µ (TPM2.5)				
CORPUS CHRISTI LIQUEFACTION PLANT	CORPUS CHRISTI LIQUEFACTION LLC	TX	Andrew Chartrand	9/12/2014	Corpus Christi Liquefaction, LLC (CCL) proposes to construct and operate natural gas liquefaction and export plant and import facilities with regasification capabilities. The liquefied natural gas (LNG) terminal will be capable of processing an annual average of approximately 2.1 billion standard cubic feet per day of pipeline-quality natural gas in the liquefaction mode and 400 million standard cubic feet per day in the vaporization mode. The project will involve liquefying natural gas into LNG to be stored in three 160,000 cubic meters storage tanks. There will be 3 identical trains. LNG will be imported or exported via LNG carriers that will arrive at the projects marine terminal. The facility will have the capability to liquefy natural gas from the pipeline system for export as LNG or import LNG and regasify it to send it out into the pipeline system.		Refrigeration compressor turbines	15.11	natural gas	40,000	hp	3 liquefied natural gas trains consisting of a total of (12) GE LM2500+ DLE turbines drive the propane and methane section compressors.	Particulate matter, total 2.5µ (TPM2.5)		0.72	LB/H	1 HOUR
ECTOR COUNTY ENERGY CENTER	INVENERGY THERMAL DEVELOPMENT LLC	TX	Jim Shield	8/1/2014	The proposed project is to construct and operate two natural gas-fired simple cycle combustion turbine generators (CTGs) at the Ector County Energy Center (ECEC), located approximately 20 miles northwest of Odessa, Texas, in Ector County.		(2) combustion turbines	15.11	natural gas	180	MW	(2) GE 7FA.03, 2500 hours of operation per year each	Particulate matter, total 2.5µ (TPM2.5)				
PERRYMAN GENERATING STATION	CONSTELLATION POWER SOURCE GENERATION, INC.	MD	Bill Leedy	7/1/2014	120 MEGAWATT SIMPLE CYCLE NATURAL GAS FIRED POWER PLANTPERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	PERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	(2) 60-MW SIMPLE CYCLE COMBUSTION TURBINES, FIRING NATURAL GAS	15.11	NATURAL GAS	120	MW	(2) 60-MEGAWATT PRATT & WHITNEY GAS TURBINE GENERATOR PACKAGE	Particulate matter, total 10µ (TPM10)	GOOD COMBUSTION PRACTICES AND USE OF NATURAL GAS	5	LB/H	3 STACK TEST RUNS

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Mark Lux	5/30/2014	Power generation facility		Turbine - simple cycle gas	15.11	natural gas	375	MMBTU/H	One (1) General Electric, simple cycle, gas turbine electric generator, Unit 6 (CT08), model: LM6000, SN: N/A, rated at 375 MMBtu per hour.	Particulate matter, total 10µ (TPM10)	Firing of pipeline quality natural gas as defined in 40 CFR Part 72. Specifically, the owner or the operator shall demonstrate that the natural gas burned has total sulfur content less than 0.5 grains/100 SCF.	4.8	LB/H	3-HR AVE
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Mark Lux	5/30/2014	Power generation facility		Turbine - simple cycle gas	15.11	natural gas	375	MMBTU/H	One (1) General Electric, simple cycle, gas turbine electric generator, Unit 6 (CT08), model: LM6000, SN: N/A, rated at 375 MMBtu per hour.	Particulate matter, total 2.5µ (TPM2.5)	Firing of pipeline quality natural gas as defined in 40 CFR Part 72. Specifically, the owner or the operator shall demonstrate that the natural gas burned has total sulfur content less than 0.5 grains/100 SCF.	4.8	LB/H	3-HR AVE
PH ROBINSON ELECTRIC GENERATING STATION	NRG TEXAS POWER LLC	TX	Craig Eckberg	5/20/2014	NRG proposes to construct six natural gas-fired simple cycle combustion turbine generators (CTG) for peaking, designed to operate during periods of high electric demand. The six CTGs selected by NRG are General Electric Frame 7E turbines have an ISO rating of 65 MW and a nominal maximum generating capacity of 80 MW. Each of the turbines will not exceed 20 percent annual capacity (equivalent to 1,752 full load hours) in any single year or 10 percent annual capacity factor (equivalent to 876 full load hours) averaged over any three year period.		(6) simple cycle turbines	15.11	natural gas	65	MW	General Electric Frame 7E turbines have an ISO rating of 65 MW and a nominal maximum generating capacity of 80 MW. The turbines were originally constructed as Frame 7B units that were remanufactured in 1999 and upgraded to 7E machines Each of the turbines will not exceed 20 percent annual capacity (equivalent to 1,752 full load hours) in any single year or 10 percent annual capacity factor (equivalent to 876 full load hours) averaged over any three year period, which qualifies each of the CTGs as Acid Rain Peaking Units under 40 CFR 72.2	Particulate matter, total 2.5µ (TPM2.5)				
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	4/22/2014	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	In this project, 24 peaking turbines from the Lauderdale facility are being replaced with five 200 MW combustion turbines at Lauderdale. The turbines will fire primarily natural gas, but may also fire ULSD fuel oil. Triggers PSD for NOx, PM, CO, VOC, and GHG. GHG permit issued by US EPA Region 4. Technical evaluation available at http://arm-permit2k.dep.state.fl.us/nontv/0110037.011.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,000	MMBtu/hr (approx)	Throughput could vary slightly (+/- 120 MMBtu/hr) depending on final selection of turbine model and firing of natural gas or oil. Primary fuel is expected to be gas. Each turbine limited to 3300 hrs per rolling 12-month period. Of these 3300 hrs, no more than 500 may use ULSD fuel oil.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practice and low-sulfur fuel			
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jeff Pippin	4/22/2014	GSEC is proposing to build three additional new CTGs at the existing Antelope Elk Energy Center. The new facility will provide primarily peaking and intermediate power needs. The new units will be GE 7F5-Series gas turbines in simple cycle application, rated at 202 MW. Each turbine will operate a maximum of 4,572 hours per year.		Combustion Turbine-Generator(CTG)	15.11	Natural Gas	202	MW	Simple Cycle	Particulate matter, filterable 2.5µ (FPM2.5)	Pipeline quality natural gas; limited hours; Good combustion practices			
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE INC	TX	Jeff Pippin	4/22/2014	Golden Spread Electric Cooperative (GSEC) currently owns and operates Antelope Station (now renamed Antelope Elk Energy Center), a 168 MW generating facility made up of 18 quick start Wartsila engines. GSEC is proposing to build a new combustion turbine-generator (CTG) facility at Antelope Station, while the 18 Wartsila engines will remain and continue to be authorized by TCEQ Standard Permit. The new turbine-generator will provide primarily peaking and intermediate power needs in a highly cyclical operation. The CTG will produce approximately 100 - 200 MW of electricity, depending on loading and ambient temperature.		combustion turbine	15.11	natural gas	202	MW	new GE 7FA 5-Series gas turbine in a simple cycle application, with a maximum electric output of 202 megawatts (MW) and a maximum design capacity of 1,941 million British thermal units per hour (MMBtu/hr). The turbine will operate a maximum of 4,572 hours per year.	Particulate matter, total 2.5µ (TPM2.5)				
TROUTDALE ENERGY CENTER, LLC	TROUTDALE ENERGY CENTER, LLC	OR	Willard Ladd	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		GE LMS-100 combustion turbines, simple cycle with water injection	15.11	natural gas	1,690	MMBTU/H		Particulate matter, total 10µ (TPM10)	Utilize only natural gas or ULSD fuel; Limit the time in startup or shutdown.	9.1	LB/H TOTAL PM	6-HR AVERAGE ON NG
LONESOME CREEK GENERATING STATION	BASIN ELECTRIC POWER COOP.	ND	Jerry Menge	9/16/2013	Three natural gas fired simple cycle turbines used to generate electricity for peak power demand. The turbines are GE LM6000 PF Sprint units with a nominal capacity of 45 MW each.		Natural Gas Fired Simple Cycle Turbines	15.11	Natural gas	412	MMBTU/H	The heat input is for a single unit.	Particulate matter, total 2.5µ (TPM2.5)		5	LB/H	AVERAGE OF THREE TEST RUNS
EDGEWOOD ENERGY LLC	EDGEWOOD ENERGY LLC	NY		7/9/2013	Edgewood Energy LLC is a power is a simple cycle combustion turbine plant located in Edgewood, Suffolk County, New York that contains two GE LM6000 combustion turbines that fire only natural gas. The facility has an optimum electrical output of 95 megawatts (MW) firing only natural gas. This electrical output represents an increase from the 79.9 MW limit. This increase was allowed through a declaratory ruling that the Department of Public Service issued. The facility is subject to PSD for greenhouse gases (GHGs) and PM-10 emissions. The facility is not subject to non-attainment NSR for any non-attainment contaminant.		Turbines - NG	15.11	natural gas				Particulate matter, filterable (FPM)		0.0112	LB/MMBTU	1 H

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PIONEER GENERATING STATION	BASIN ELECTRIC POWER COOPERATIVE	ND	Jerry Menge	5/14/2013	Three GE LM6000 PC SPRINT natural gas fired turbines used to generate electricity for peak periods.	The permit was for the addition of 2 turbines to the station. Since a synthetic minor limit was relaxed for the first unit, BACT was required for all three turbines.	Natural gas-fired turbines	15.11	Natural gas	451	MMBTU/H	Rating is for each turbine.	Particulate matter, total 2.5µ (TPM2.5)		5.4	LB/H	
ECTOR COUNTY ENERGY CENTER	INVENERGY THERMAL DEVELOPMENT LLC	TX	Jim Shield	5/13/2013	The proposed project is for two natural gas fired simple cycle CTGs. The proposed models include GE7Fa.03 and GE7Fa.05. They have an output of 165-193 MW. The new CTGs will operate as peaking units and will be limited to 2500 hours per year of operation each.		Simple Cycle Combustion Turbines	15.11	natural gas	180	MW		Particulate matter, total 2.5µ (TPM2.5)	Firing pipeline quality natural gas and good combustion practices			
R.M. HESKETT STATION	MONTANA-DAKOTA UTILITIES CO.	ND	Abbie Krebsbach	2/22/2013	Addition of a natural gas-fired turbine (Unit 3) to an existing coal-fired power plant. The turbine will be used for supplying peak power and is rated at 986 MMBtu/hr and 88 MWe at average site conditions.		Combustion Turbine	15.11	Natural gas	986	MMBTU/H	Turbine is a GE Model PG 7121 (7EA) used as a peaking unit.	Particulate matter, total 10µ (TPM10)	Good Combustion Practices	7.3	LB/H	AVERAGE OF 3 TEST RUNS
R.M. HESKETT STATION	MONTANA-DAKOTA UTILITIES CO.	ND	Abbie Krebsbach	2/22/2013	Addition of a natural gas-fired turbine (Unit 3) to an existing coal-fired power plant. The turbine will be used for supplying peak power and is rated at 986 MMBtu/hr and 88 MWe at average site conditions.		Combustion Turbine	15.11	Natural gas	986	MMBTU/H	Turbine is a GE Model PG 7121 (7EA) used as a peaking unit.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practices.	7.3	LB/H	AVERAGE OF THREE TEST RUNS
PIO PICO ENERGY CENTER	PIO PICO ENERGY CENTER, LLC	CA	Gary Chandler	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (NORMAL OPERATION)	15.11	NATURAL GAS	300	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Particulate matter, total (TPM)	PUC-QUALITY NATURAL GAS	0.0065	LB/MMBTU (HHV)	AT LOADS OF 80% OR HIGHER
PIO PICO ENERGY CENTER	PIO PICO ENERGY CENTER, LLC	CA	Gary Chandler	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (NORMAL OPERATION)	15.11	NATURAL GAS	300	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Particulate matter, total 10µ (TPM10)	PUC-QUALITY NATURAL GAS	0.0065	LB/MMBTU (HHV)	AT LOADS OF 80% OR HIGHER
PIO PICO ENERGY CENTER	PIO PICO ENERGY CENTER, LLC	CA	Gary Chandler	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (NORMAL OPERATION)	15.11	NATURAL GAS	300	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Particulate matter, filterable 2.5µ (FPM2.5)	PUC-QUALITY NATURAL GAS	0.0065	LB/MMBTU (HHV)	AT LOADS OF 80% OR HIGHER
CEDAR BAYOU ELECTRIC GERNERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	9/12/2012	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the simple cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The units will produce between 215-263 MW each.		Simple Cycle Combustion Turbines	15.11	Natural Gas	225	MW	The gas turbines will be one of three options: (1) Two Siemens Model F5 (SF5) CTGs each rated at nominal capability of 225 megawatts (MW). (2) Two General Electric Model 7FA (GE7FA) CTGs each rated at nominal capability of 215 MW. (3) Two Mitsubishi Heavy Industry G Frame (MHI501G) CTGs each rated at a nominal electric output of 263 MW.	Particulate matter, filterable 2.5µ (FPM2.5)	Good Combustion Practices, Natural Gas			
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP05)	15.11	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP03)	15.11	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP04)	15.11	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP05)	15.11	Natural Gas	40	MW		Particulate matter, total (TPM)	good combustion practices	4	LB/H	3-HOUR AVERAGE

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CALCASIEU PLANT	ENTERGY GULF STATES LA LLC	LA	Christee Herbert	12/21/2011	320 MW POWER PLANT COMPRISED OF 2 NATURAL GAS-FIRED SIMPLE CYCLE COMBUSTION TURBINES.	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS PSD TRIGGERED DUE TO RELAXATION OF A FEDERALLY-ENFORCEABLE CONDITION LIMITING POTENTIAL EMISSIONS BELOW MAJOR STATIONARY SOURCE THRESHOLDS.	TURBINE EXHAUST STACK NO. 1 & NO. 2	15.11	NATURAL GAS	1,900	MM BTU/H EACH		Particulate matter, total 2.5µ (TPM2.5)	USE OF PIPELINE NATURAL GAS	17	LB/H	HOURLY MAXIMUM
CALCASIEU PLANT	ENTERGY GULF STATES LA LLC	LA	Christee Herbert	12/21/2011	320 MW POWER PLANT COMPRISED OF 2 NATURAL GAS-FIRED SIMPLE CYCLE COMBUSTION TURBINES.	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS PSD TRIGGERED DUE TO RELAXATION OF A FEDERALLY-ENFORCEABLE CONDITION LIMITING POTENTIAL EMISSIONS BELOW MAJOR STATIONARY SOURCE THRESHOLDS.	TURBINE EXHAUST STACK NO. 1 & NO. 2	15.11	NATURAL GAS	1,900	MM BTU/H EACH		Particulate matter, total 10µ (TPM10)	USE OF PIPELINE NATURAL GAS	17	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Refrigeration Compressor Turbines (16)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Particulate matter, total (TPM)	Good combustion practices and fueled by natural gas	2.08	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Generation Turbines (2)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Particulate matter, total (TPM)	Good combustion practices and fueled by natural gas	2.08	LB/H	HOURLY MAXIMUM
CUNNINGHAM POWER PLANT	SOUTHWESTERN PUBLIC SERVICE CO.	NM	Kevin Worley	5/2/2011	Electric steam generating facility providing commercial electric power using natural gas fired boilers and turbines.	Simple Cycle Combustion Turbines. Permit revises the NOx BACT ppmvd limit for turbines established in permit PSD-NM-622-M2 issued 2-10-97 because turbines have not been able to meet NOx BACT limits. No modification or change to mass emissions. Former NOx BACT was at 15 ppmvd w/out power augmentation (normal mode) and 25 ppmvd w/ power augmentation (see RBLC ID NM-0028). Entry also clarifies the existing CO, SOx, and PM BACT.	Normal Mode (without Power Augmentation)	15.11	natural gas				Particulate matter, filterable 10µ (FPM10)	Good Combustion Practices as described in the permit.	5.4	LB/H	HOURLY
CUNNINGHAM POWER PLANT	SOUTHWESTERN PUBLIC SERVICE CO.	NM	Kevin Worley	5/2/2011	Electric steam generating facility providing commercial electric power using natural gas fired boilers and turbines.	Simple Cycle Combustion Turbines. Permit revises the NOx BACT ppmvd limit for turbines established in permit PSD-NM-622-M2 issued 2-10-97 because turbines have not been able to meet NOx BACT limits. No modification or change to mass emissions. Former NOx BACT was at 15 ppmvd w/out power augmentation (normal mode) and 25 ppmvd w/ power augmentation (see RBLC ID NM-0028). Entry also clarifies the existing CO, SOx, and PM BACT.	Power Augmentation	15.11	natural gas			Increase power output by lowering the outlet air temperature through water injections into the compressor.	Particulate matter, filterable 10µ (FPM10)	Good combustion practices as defined in the permit.	5.4	LB/H	HOURLY
PSEG FOSSIL LLC KEARNY GENERATING STATION	PSEG FOSSIL LLC	NJ		10/27/2010	PSEG FOSSIL LLC KEARNY GENERATING STATION IS AN EXISTING ELECTRICITY GENERATING STATION.	This project consists of six new identical General Electric LM6000 sprint simple cycle combustion turbines burning natural gas. Each turbine will have a heat input rate of 485 million British thermal units per hour (MMBtu/hr) based on the high heating value of fuel (HHV). The combined maximum electricity generated by the six turbines will be 294 MW based on 2,978 hours of operation per turbine per year. All six new turbines will have water injection along with Selective Catalytic Reduction (SCR) systems to reduce Nitrogen Oxide (NOx) emissions and an oxidation catalyst to reduce Carbon Monoxide (CO) emissions	SIMPLE CYCLE TURBINE	15.11	Natural Gas	8,940,000	MMBtu/year (HHV)	Throughput <= 8.94xE6 MMBtu/year (HHV) combined for all six gas turbines. The 6 turbines are identical LM6000 simple cycle combustion turbines.	Particulate matter, total 10µ (TPM10)	Good combustion practice, Use of Clean Burning Fuel: Natural gas	6	LB/H	AVERAGE OF THREE TESTS

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSEG FOSSIL LLC KEARNY GENERATING STATION	PSEG FOSSIL LLC	NJ		10/27/2010	PSEG FOSSIL LLC KEARNY GENERATING STATION IS AN EXISTING ELECTRICITY GENERATING STATION.	This project consists of six new identical General Electric LM6000 sprint simple cycle combustion turbines burning natural gas. Each turbine will have a heat input rate of 485 million British thermal units per hour (MMBtu/hr) based on the high heating value of fuel (HHV). The combined maximum electricity generated by the six turbines will be 294 MW based on 2,978 hours of operation per turbine per year. All six new turbines will have water injection along with Selective Catalytic Reduction (SCR) systems to reduce Nitrogen Oxide (NOx) emissions and an oxidation catalyst to reduce Carbon Monoxide (CO) emissions	SIMPLE CYCLE TURBINE	15.11	Natural Gas	8,940,000	MMBtu/year (HHV)	Throughput <= 8.94xE6 MMBtu/year (HHV) combined for all six gas turbines. The 6 turbines are identical LM6000 simple cycle combustion turbines.	Particulate matter, total 2.5µ (TPM2.5)	Good combustion practice, Use of Clean Burning Fuel: Natural gas	6	LB/H	AVERGE OF THREE TESTS
PSEG FOSSIL LLC KEARNY GENERATING STATION	PSEG FOSSIL LLC	NJ		10/27/2010	PSEG FOSSIL LLC KEARNY GENERATING STATION IS AN EXISTING ELECTRICITY GENERATING STATION.	This project consists of six new identical General Electric LM6000 sprint simple cycle combustion turbines burning natural gas. Each turbine will have a heat input rate of 485 million British thermal units per hour (MMBtu/hr) based on the high heating value of fuel (HHV). The combined maximum electricity generated by the six turbines will be 294 MW based on 2,978 hours of operation per turbine per year. All six new turbines will have water injection along with Selective Catalytic Reduction (SCR) systems to reduce Nitrogen Oxide (NOx) emissions and an oxidation catalyst to reduce Carbon Monoxide (CO) emissions	SIMPLE CYCLE TURBINE	15.11	Natural Gas	8,940,000	MMBtu/year (HHV)	Throughput <= 8.94xE6 MMBtu/year (HHV) combined for all six gas turbines. The 6 turbines are identical LM6000 simple cycle combustion turbines.	Particulate matter, filterable (FPM)	Good combustion practice, Use of Clean Burning Fuel: Natural gas	6	LB/H	AVERAGE OF THREE TESTS
HOWARD DOWN STATION	VINELAND MUNICIPAL ELECTRIC UTILITY (VMEU)	NJ		9/16/2010			SIMPLE CYCLE (NO WASTE HEAT RECOVERY)(> 25 MW)	15.11	NATURAL GAS	5,000	MMFT3/YR	THE PROCESS CONSISTS OF ONE NEW TRENT 60 SIMPLE CYCLE COMBUSTION TURBINE. THE TURBINE WILL GENERATE 64 MW OF ELECTRICITY USING NATURAL GAS AS A PRIMARY FUEL (UP TO 8760 HOURS PER YEAR), WITH A BACKUP FUEL OF ULTRA LOW SULFUR DIESEL FUEL (ULSD) WHICH CAN ONLY BE COMBUSTED FOR A MAXIMUM OF 500 HOURS PER YEAR AND ONLY DURING NATURAL GAS CURTAILMENT. THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING NATURAL GAS IS 590 MMBTU/HR AND THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING ULSD IS 568 MMBTU/HR. THE TURBINE WILL UTILIZE WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION TO CONTROL NOX EMISSION AND A CATALYTIC OXIDIZER TO CONTROL CO AND VOC EMISSION.	Particulate matter, filterable 10µ (FPM10)	USE OF CLEAN BURNING FUELS; NATURAL GAS AS PRIMARY FUEL AND ULTRA LOW SULFUR DISTILLATE OIL WITH 15 PPMSULFUR BY WEIGHT AS BACKUP FUEL	5	LB/H	AVERAGE OF THREE TESTS
HOWARD DOWN STATION	VINELAND MUNICIPAL ELECTRIC UTILITY (VMEU)	NJ		9/16/2010			SIMPLE CYCLE (NO WASTE HEAT RECOVERY)(> 25 MW)	15.11	NATURAL GAS	5,000	MMFT3/YR	THE PROCESS CONSISTS OF ONE NEW TRENT 60 SIMPLE CYCLE COMBUSTION TURBINE. THE TURBINE WILL GENERATE 64 MW OF ELECTRICITY USING NATURAL GAS AS A PRIMARY FUEL (UP TO 8760 HOURS PER YEAR), WITH A BACKUP FUEL OF ULTRA LOW SULFUR DIESEL FUEL (ULSD) WHICH CAN ONLY BE COMBUSTED FOR A MAXIMUM OF 500 HOURS PER YEAR AND ONLY DURING NATURAL GAS CURTAILMENT. THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING NATURAL GAS IS 590 MMBTU/HR AND THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING ULSD IS 568 MMBTU/HR. THE TURBINE WILL UTILIZE WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION TO CONTROL NOX EMISSION AND A CATALYTIC OXIDIZER TO CONTROL CO AND VOC EMISSION.	Particulate matter, filterable 2.5µ (FPM2.5)	USE OF CLEAN BURNING FUELS; NATURAL GAS AS PRIMARY FUEL AND ULTRA LOW SULFUR DISTILLATE OIL WITH 15 PPMSULFUR BY WEIGHT AS BACKUP FUEL	5	LB/H	AVERAGE OF THREE TESTS
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Three simple cycle combustion turbines	15.11	natural gas	799.7	MMBTU/H	Three GE, LMS100PA, natural gas-fired, simple cycle CTG rated at 799.7 MMBtu per hour each, based on HHV.	Particulate matter, total (TPM)	Use of pipeline quality natural gas and good combustor design	6.6	LB/H	AVE OVER STACK TEST LENGTH
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Three simple cycle combustion turbines	15.11	natural gas	799.7	MMBTU/H	Three GE, LMS100PA, natural gas-fired, simple cycle CTG rated at 799.7 MMBtu per hour each, based on HHV.	Particulate matter, total 10µ (TPM10)	Use of pipeline quality natural gas and good combustor design	6.6	LB/H	AVE OVER STACK TEST LENGTH

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
DAYTON POWER & LIGHT ENERGY LLC	DAYTON POWER & LIGHT COMPANY	OH	Carrie Burks	12/3/2009	Seven simple cycle stationary combustion turbines all with rating of 80 MW and nominal heat input of 1115.2 mmBtu/hr using natural gas or No. 2 fuel oil and all with water injection control and last 5 also with low NOx burners.	Simple cycle stationary combustion turbines issued in 2 different permits. Four turbines in this permit with dry low NOx combustion and water injection controls. Administrative Modification to original PTI #08-04153 issued 8/7/01, to incorporate low mass emissions methodology as allowed per 40 CFR 75.19 in lieu of methods under Appendix D or E to Part 75, by meeting the requirements of having mass emissions of less than 25 T/YR SO2 and less than 100 T/YR NOx (per turbine) based on 3 years of operation. Modification also reduced permitted formaldehyde emissions by 8.7 tons, recalculated based on the restriction on hours of operation.	Turbines (4), simple cycle, natural gas	15.11	NATURAL GAS	15,020	H/YR	Hours per year for all 4 turbines	Particulate matter, filterable (FPM)		0.013	LB/MMBTU	ACTUAL HEAT INPUT
DAYTON POWER & LIGHT ENERGY LLC	DAYTON POWER & LIGHT COMPANY	OH	Carrie Burks	12/3/2009	Seven simple cycle stationary combustion turbines all with rating of 80 MW and nominal heat input of 1115.2 mmBtu/hr using natural gas or No. 2 fuel oil and all with water injection control and last 5 also with low NOx burners.	Simple cycle stationary combustion turbines issued in 2 different permits. Four turbines in this permit with dry low NOx combustion and water injection controls. Administrative Modification to original PTI #08-04153 issued 8/7/01, to incorporate low mass emissions methodology as allowed per 40 CFR 75.19 in lieu of methods under Appendix D or E to Part 75, by meeting the requirements of having mass emissions of less than 25 T/YR SO2 and less than 100 T/YR NOx (per turbine) based on 3 years of operation. Modification also reduced permitted formaldehyde emissions by 8.7 tons, recalculated based on the restriction on hours of operation.	Turbines (4), simple cycle, natural gas	15.11	NATURAL GAS	15,020	H/YR	Hours per year for all 4 turbines	Particulate matter, filterable 10µ (FPM10)		0.013	LB/MMBTU	ACTUAL HEAT INPUT
BAYONNE ENERGY CENTER	BAYONNE ENERGY CENTER, LLC	NJ	Neil Collins	9/24/2009	TITLE V FACILITY - ID: 12863 A MAXIMUM 512 MW SIMPLE-CYCLE POWER GENERATING FACILITY LOCATED IN THE TOWNSHIP OF BAYONNE, NEW JERSEY, CONSISTING OF EIGHT IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES SUBJECT TO LAER FOR NOX, VOC	SUBJECT TO LAER FOR NOX, VOC	COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8	15.11	NATURAL GAS	603	MMBTU/H	EIGHT (8) IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES. EACH TURBINE HAS A RATED CAPACITY OF 603 MILLION BRITISH THERMAL UNIT PER HOUR HIGHER HEATING VALUE (MMBTU/HR HHV) WHEN BURNING NATURAL GAS AND A RATED CAPACITY OF 538 MMBTU/HR WHEN BURNING ULTRA LOW SULFUR DISTILLATE (ULSD) OIL WITH SULFUR CONTENT OF LESS THAN OR EQUAL TO 15 PPM BY WEIGHT. HOURS OF OPERATION FOR EACH COMBUSTION TURBINE WILL BE LIMITED TO 4,748 HOURS PER YEAR ON NATURAL GAS; OR 2,585 HOURS PER YEAR ON NATURAL GAS AND 720 HOURS PER YEAR ON ULSD WHEN OPERATING ON BOTH FUELS. POLLUTANT EMISSSION VAUES FOR ULSD OIL NOX: 5 PPMVD@ 15% O2 CO: 5 PPMVD@ 15% O2 VOC: 3.27 LB/HR PM10: 15 LB/HR SO2: 0.8 LB/HR	Particulate matter, filterable 10µ (FPM10)	BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM.	5	LB/H	

Table C-2. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - PM Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
BAYONNE ENERGY CENTER	BAYONNE ENERGY CENTER, LLC	NJ	Neil Collins	9/24/2009	TITLE V FACILITY - ID: 12863 A MAXIMUM 512 MW SIMPLE-CYCLE POWER GENERATING FACILITY LOCATED IN THE TOWNSHIP OF BAYONNE, NEW JERSEY, CONSISTING OF EIGHT IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES SUBJECT TO LAER FOR NOX, VOC	SUBJECT TO LAER FOR NOX, VOC	COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8	15.11	NATURAL GAS	603	MMBTU/H	EIGHT (8) IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES. EACH TURBINE HAS A RATED CAPACITY OF 603 MILLION BRITISH THERMAL UNIT PER HOUR HIGHER HEATING VALUE (MMBTU/HR HHV) WHEN BURNING NATURAL GAS AND A RATED CAPACITY OF 538 MMBTU/HR WHEN BURNING ULTRA LOW SULFUR DISTILLATE (ULSD) OIL WITH SULFUR CONTENT OF LESS THAN OR EQUAL TO 15 PPM BY WEIGHT. HOURS OF OPERATION FOR EACH COMBUSTION TURBINE WILL BE LIMITED TO 4,748 HOURS PER YEAR ON NATURAL GAS; OR 2,585 HOURS PER YEAR ON NATURAL GAS AND 720 HOURS PER YEAR ON ULSD WHEN OPERATING ON BOTH FUELS. POLLUTANT EMISSSION VAUES FOR ULSD OIL NOX: 5 PPMVD@ 15% O2 CO: 5 PPMVD@ 15% O2 VOC: 3.27 LB/HR PM10: 15 LB/HR SO2: 0.8 LB/HR	Particulate matter, filterable 2.5µ (FPM2.5)	BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM.	5	LB/H	
SHADY HILLS GENERATING STATION	SHADY HILLS POWER COMPANY	FL	Roy S. Belden	1/12/2009	THIS FACILITY CONSISTS OF THREE, DUAL-FUEL, NOMINAL 170 MW GENERAL ELECTRIC MODEL PG7241FA (GE 7FA) SIMPLE CYCLE COMBUSTION TURBINES-ELECTRICAL GENERATORS, THREE EXHAUST STACKS THAT ARE 18 FEET IN DIAMETER AND 75 FEET TALL, AND ONE 2.8-MILLION GALLON DISTILLATE FUEL OIL STORAGE TANK. THE COMBUSTION TURBINE UNITS CAN OPERATE IN SIMPLE-CYCLE MODE AND INTERMITTENT DUTY MODE. THE UNITS ARE EQUIPPED WITH DRY LOW-NITROGEN OXIDES (NOX) COMBUSTORS AND WATER INJECTION CAPABILITY. THE THREE COMBUSTION TURBINES ARE REGULATED UNDER PHASE II OF THE FEDERAL ACID RAIN PROGRAM. THIS FACILITY OPERATES DURING PEAK HOURS OF ELECTRICAL USE.		TWO SIMPLE CYCLE COMBUSTION TURBINE - MODEL 7FA	15.11	NATURAL GAS	170	MW	BACKUP FUEL: ULTRA LOW SULFUR DIESEL WITH A MAXIMUM SULFUR CONTENT OF 0.0015%, BY WEIGHT	Particulate matter, total 10µ (TPM10)		10	% OPACITY	6-MINUTE BLOCK BY EPA METHOD 9

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
NEW COVERT GENERATING FACILITY	NEW COVERT GENERATING COMPANY, LLC	MI	John Reese	7/30/2018	Power plant	The equipment consists of three advanced firing temperature Mitsubishi 501G combustion turbines, three heat recovery steam generators supplemented with gas-fired duct burners each with a max firing rate of 256 million British thermal units per hour (MMBtu/ hr), three steam turbine generators. Auxiliary equipment includes three mechanical draft evaporative cooling towers, one natural gas auxiliary boiler, one diesel emergency generator, one diesel fire water pump, one aqueous parts cleaner, and one gas heater.	FG-TURB/ DB1-3 (3 combined cycle combustion turbine and heat recovery steam generator trains)	15.21	Natural gas	1,230	MW	Three (3) combined-cycle combustion turbine (CT) / heat recovery steam generator (HRSG) trains. Each CT is a natural gas fired Mitsubishi model 501G, equipped with dry low NOx combustor and inlet air evaporative cooling. Each HRSG includes a natural gas fired duct burner with a 256 MMBtu/ hr heat input capacity and a dry low NOx burner.	Nitrogen Oxides (NOx)	Good combustion practices, DLN burners and SCR.	2.00	PPMVD	AT 15%O2; EACH INDIV. CT/ HRSG TRAIN
NEW COVERT GENERATING FACILITY	NEW COVERT GENERATING COMPANY, LLC	MI	John Reese	7/30/2018	Power plant	The equipment consists of three advanced firing temperature Mitsubishi 501G combustion turbines, three heat recovery steam generators supplemented with gas-fired duct burners each with a max firing rate of 256 million British thermal units per hour (MMBtu/ hr), three steam turbine generators. Auxiliary equipment includes three mechanical draft evaporative cooling towers, one natural gas auxiliary boiler, one diesel emergency generator, one diesel fire water pump, one aqueous parts cleaner, and one gas heater.	FG-TURB/ DB1-3--Startup/ Shutdown Operations	15.21	Natural gas	1,230	MW	Three (3) combined-cycle combustion turbine (CT) / heat recovery steam generator (HRSG) trains. Each CT is a natural gas fired Mitsubishi model 501G, equipped with dry low NOx combustor and inlet air evaporative cooling. Each HRSG includes a natural gas fired duct burner with a 256 MMBTU/ Hr heat input capacity and a dry low NOx burner. This scenario identifies the emission limits applicable during startup and shutdown operations.	Nitrogen Oxides (NOx)	Good combustion practices, DLN burners and SCR.	249	LB/ H	EACH CT/ HRSG TRAIN;STARTUP/ SHUTDOWN
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)	15.21	Natural gas			Two (2) combined-cycle natural gas-fired combustion turbine generators, each with a heat recovery steam generator (CTGHRSG). Plant nominal 1,150 MW electricity production. Turbines are each rated at 3,658 MMBTU/ H and HRSG duct burners are each rated at 800 MMBTU/ H. The HRSGs are not capable of operating independently from the CTGs.	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with dry low NOx burners).	2	PPMVD	AT 15%O2; 24-H ROLL AVG; EACH UNIT;
BELLE RIVER COMBINED CYCLE POWER PLANT	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)--Startup Shutdown	15.21	Natural gas			This section is the startup and shutdown emission limits for FGCTGHRSG. Two 3,658 MMBTU/ H natural gas-fired combustion turbine generators (CTGs) coupled with heat recovery steam generators (HRSGs). The HRSGs are equipped with natural gas-fired duct burners rated at 800 MMBTU/ H to provide heat for additional steam production. The HRSGs are not capable of operating independently from the CTGs.	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with dry low NOx burners).	262.4	LB/ H	EACH UNIT; OPERATING HOUR DURING S.S.
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (South Plant): A combined cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/ H (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/ H (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/ HRSG is equipped with dry low NOx burner (DLNB), SCR and an oxidation catalyst.	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with dry low NOx burners).	2	PPMV	AT 15%O2; 24-HR ROLL AVG NOT S.S.

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MEC NORTH, LLC AND MEC SOUTH LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (North Plant): A combined-cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	Nominal 500 MW electricity production. Turbine rating of 3,080 MMBTU/ hr (HHV) and HRSG duct burner rating of 755 MMBTU/ hr (HHV). A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/ hr (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/ hr (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/ HRSG is equipped with dry low NOx burner (DLNB), SCR, and an oxidation catalyst.	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with Dry Low NOx burners).	2	PPMVD	AT 15%O2; 24-H ROLL AVG; NOT S.S.
INDECK NILES LLC	INDECK NILES LLC	MI	Michael Dubois	6/26/2018	Natural gas combined cycle power plant	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks. Also, the permit revises the concentration-based NOx emission limit applied to the two combined-cycle natural gas-fired combustion turbines with heat recovery steam generators (identified as EUCTGHRSG1 and EUCTGHRSG2) in the original permit 75-16.	FGCTGHRSG (2 Combined Cycle CTG with HRSGs)	15.21	Natural gas	3,421	MMBTU/ H	3421 MMBTU/ H for each turbine and 740 MMBTU/ H for each duct burner for a combined throughput of 4161 MMBTU/ H or 8322 MMBTU/ H for both trains. Two combined-cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSG) (EUCTGHRSG1 & EUCTGHRSG2). The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period.	Nitrogen Oxides (NOx)	SCR with DLNB (Selective Catalytic Reduction with Dry Low NOx Burners)	2	PPM	AT 15%O2; 24-HR ROLL AVG
PALMDALE ENERGY PROJECT	PALMDALE ENERGY, LLC	CA	Tom Cameron	4/25/2018	645 MW (nominal) Natural Gas-fired Combined Cycle Power Plant, 2 x 1 configuration, auxiliary boiler for faster startup	See also docket: https://www.regulations.gov/docket?D=EPA-R09-OAR-2017-0473. Permit decision was appealed to EPA's Environmental Appeals Board. Board denied review on October 23, 2018. Information available through www.epa.gov/eab and https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/f22b4b245fab46c6852570e6004df1bd/ad735c0b822500258525829d004217eb!OpenDocument.	Combustion Turbines (GEN1 and GEN2)	15.21	Natural Gas	2,217	MMBtu/hr	Each combustion turbine rated at 214 MW, with a maximum heat input rate of 2,217 MMBtu/hr (HHV, at ISO conditions); natural gas-fired Siemens SGT6-5000F; each vents to dedicated Heat Recovery Steam Generator and a shared 276 MW Steam Turbine Generator; 160-ft stack height; 22-ft stack diameter	Nitrogen Oxides (NOx)	Selective Catalytic Reduction, Dry Low NOx Burners	2	PPM @ 15% O2	1-HOUR
MONTGOMERY COUNTY POWER STATION	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			Combined Cycle Turbine	15.21	NATURAL GAS	2,635	MMBTU/ HR/ UNIT	Two Mitsubishi M501GAC turbines (without fast start)	Nitrogen Oxides (NOx)	SCR and Dry Low NOx burners	2	PPMVD	15% O2 1-HOUR AVERAGE
MONTGOMERY COUNTY POWER STATION	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			COMBINED CYCLE TURBINE MSS REDUCED LOAD	15.21	NATURAL GAS			9 HOURS STARTUP, 1 HOUR SHUTDOWN	Nitrogen Oxides (NOx)	minimizing duration of startup / shutdown events, engaging the pollution control equipment as soon as practicable (based on vendor recommendations and guarantees), and meeting the emissions limits on the MAERT	170	LB/ H	
HARRISON COUNTY POWER PLANT	ESC HARRISON COUNTY POWER, LLC	WV	Andrew Dorn	3/27/2018	Nominal 640 mWe natural gas-fired combined-cycle power plant. Small sources: Emergency Generator, Fire Water Pump, Fuel Gas Heater not included in RBLC - may request info or see permit for details.		GE 7HA.02 Turbine	15.21	Natural Gas	3,496	MMBtu/ hr	Nominal 640 mWe All emission limits steady-state and include 1000 MMBtu/ hr Duct Burner in operation Short Term startup and shutdown limits in lb/ event given in permit.	Nitrogen Oxides (NOx)	Dry-Low NOx Burners, SCR	33	LB/ HR	1-HOUR AVERAGE
FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Combined cycle CTG with unfired HRSG)	15.21	Natural gas	1,935	MMBTU/ H	A 1,934.7 MMBTU/ H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with dry low NOx burners).	3.00	PPM	24-H ROLL.AVG., EXCEPT STARTUP/ SHUTDOWN
FILER CITY STATION	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Startup/ Shutdown)	15.21	Natural gas	1,935	MMBTU/ H	This emission unit is being entered as a separate process to account for the emission limits associated with startup/ shutdown events, which could not be included within the previous EUCCT original process name. A 1,934.7 MMBTU/ H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Nitrogen Oxides (NOx)	SCR with DLNB (Selective catalytic reduction with dry low NOx burners).	32	POUNDS	PER EVENT

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/ o Duct Firing	15.21	Natural Gas	2,969	MMBtu/ hr	Throughput is for turbine only	Nitrogen Oxides (NOx)	SCR	2.00	PPMVD @15% O2	1 HOUR BLOCK
KILLINGLY ENERGY CENTER	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/ Duct Firing	15.21	Natural Gas	2,639	MMBtu/ hr	Duct burner MRC is 946 MMBtu/ hr	Nitrogen Oxides (NOx)	SCR	2.00	PPMVD @15% O2	1 HOUR BLOCK
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) and Dry Low NOx burners	2.00	PPMVD	15% O2 3-H AVG
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) and Dry Low NOx burners	2.00	PPMVD	15% O2 3-H AVG
INDECK NILES, LLC	INDECK NILES, LLC	MI	Michael Dubois	1/4/2017	Natural gas combined cycle power plant.	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)	15.21	Natural gas	8,322	MMBTU/ H	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The throughput capacity is 3421 MMBTU/ H for each turbine, and 740 MMBTU/ H for each duct burner for a combined throughput of 4161 MMBTU/ H or 8322 MMBTU/ H for both trains.	Nitrogen Oxides (NOx)	SCR with DLNB (selective catalytic reduction with dry low NOx burners)	38	LB/ H	24-H ROLLING AVERAGE
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG (2 Combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/ H, each	Two combined cycle natural gas fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period.	Nitrogen Oxides (NOx)	Selective catalytic reduction with dry low NOx burners (SCR with DLNB).	3.00	PPM AT 15% O2	24-H ROLLING AVG; EACH EU
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG-- Startup/ Shutdown (2 combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/ H; EACH	Two combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. This process group is to identify emission limits during startup and shutdown.	Nitrogen Oxides (NOx)	Selective catalytic reduction with dry low NOx burners (SCR with DLNB).	44	LB/ H	OPERATING HOUR DURING STARTUP; EACH EU

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CPV FAIRVIEW ENERGY CENTER	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/ hr (natural gas), 3,274-MMBtu/ hr (ULSD), 3,199 MMBtu/ hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/ hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/ hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/ hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/ hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG with duct burner NG only	15.21	Natural Gas	3,338	MMBtu/ hr	Emission limits are for each turbine operating with duct burner and do not include startup/ shutdown emissions. Tons per year limits is a cumulative value for all three CCCT. CEMS for NOx, CO, and O2. Each CCCT and duct burner have 5 operational scenarios: 1 CCCT with duct burner fired - fueled by NG only 2 CCCT with duct burner fired - fueled by NG blend with ethane 3 CCCT without duct burner fired - fueled by NG only 4 CCCT without duct burner fired - fueled by NG blend with ethane 5 CCCT without duct burner fired - fueled by ULSD (Limited to emergency use only)	Nitrogen Oxides (NOx)	Dry Low NOx combustion technology, SCR at all steady state operating loads, good combustion and operating practices	2.00	PPMDV @ 15% O2	
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1A	15.21	Natural Gas	3,625	MMBTU/ hr		Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) with Dry Low NOx Burners (DLNB) during normal operations; Good Combustion Practices during Startup/ Shutdown operations.	27	LB/ H	HOURLY MAXIMUM
ST. CHARLES POWER STATION	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1B	15.21	Natural Gas	3,625	MMBTU/ hr		Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) with Dry Low NOx Burners (DLNB) during normal operations, and good combustion practices during startup/ shutdown operations.	27	LB/ H	HOURLY MAXIMUM
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/ HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/ HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/ HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/ HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/ HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/ HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas with Duct Burner	15.21	natural gas	4,000	h/ yr		Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX	2.00	PPMVD @ 15%O2	3 H ROLLING AV BASED ON ONE H BLOCK AV
MIDDLESEX ENERGY CENTER, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/ HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/ HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/ HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/ HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/ HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/ HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas without Duct Burner	15.21	Natural Gas	8,040	H/ YR		Nitrogen Oxides (NOx)	Selective Catalytic Reduction System and Dry Low NOx	2.00	PPMVD @ 15%O2	3 H ROLLING AV BASED ON ONE H BLOCK AV

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
GREENSVILLE POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Mark Mitchell	6/17/2016	The proposed project will be a new, nominal 1,600 MW combined-cycle electrical power generating facility utilizing three combustion turbines each with a duct-fired heat recovery steam generator (HRSG) with a common reheat condensing steam turbine generator (3 on 1 configuration). The proposed fuel for the turbines and duct burners is pipeline-quality natural gas.		COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)	15.21	natural gas	3,227	MMBTU/ HR	3227 MMBTU/ HR CT with 500 MMBTU/ HR Duct Burner, 3 on 1 configuration.	Nitrogen Oxides (NOx)	SCR	2.00	PPMVD	1 HR AVG
JOHNSONVILLE COGENERATION	TENNESSEE VALLEY AUTHORITY	TN	Clay Cherry	4/19/2016	Existing gas-fired combustion turbine with new heat recovery steam generator (HRSG) with duct burner and two new gas-fired auxiliary boilers.	Facility-wide emissions increases do not include decreases due to shutdown of coal-fired units.	Natural Gas-Fired Combustion Turbine with HRSG	15.21	Natural Gas	1,339	MMBtu/ hr	Turbine throughput is 1019.7 MMBtu/ hr when burning natural gas and 1083.7 MMBtu/ hr when burning No. 2 oil. Duct burner throughput is 319.3 MMBtu/ hr. Duct burner firing will occur during natural gas combustion only.	Nitrogen Oxides (NOx)	Good combustion design and practices, selective catalytic reduction (SCR)	2.00	PPMVD @ 15% O2	30 UNIT-OPERATING-DAY MOVING AVERAGE
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/ yr.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/ yr.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This œProject to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (œgpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine without Duct Burner Firing Natural Gas	15.21	Natural Gas	28,169,501	MMBTU/YR	Natural Gas Usage: <=28,169,501 MMBtu/year which includes maximum ultra low sulfur distillate oil usage of =2,371,943 MMBTU/year	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM	2.00	PPMVD@ 15%O2	3 H ROLLING AV BASED ON ONE H BLOCK
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This œProject to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (œgpm) auxiliary wet mechanical draft cooling tower.	Combined Cycle Combustion Turbine with Duct Burner firing natural gas	15.21	Natural Gas				Nitrogen Oxides (NOx)	SCR and use of natural gas a clean burning fuel	2.00	PPMVD@ 15%O2	3 H ROLLING AV BASED ON ONE H BLOCK

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
OKEECHOBEE CLEAN ENERGY CENTER	FLORIDA POWER & LIGHT	FL	John Hampp	3/9/2016	Fossil-fueled power plant, consisting of a 3-on-1 combined cycle unit and auxiliary equipment. The combined cycle unit consists of three GE 7HA.02 turbines, each with nominal generating capacity of 350 MW. The total generating capacity for the combined cycle unit is 1,600 MW.	Technical evaluation of project available at http:/ / depedms.dep.state.fl.us/ Oculus/ servlet/ shell?command=getEntity&[guid=75.8 9000.1]&[profile=Permitting_Authoriz ation]	Combined-cycle electric generating unit	15.21	Natural gas	3,096	MMBtu/ hr per turbine	3-on-1 combined cycle unit. GE 7HA.02 turbines, approximately 350 MW per turbine. Total unit generating capacity is approximately 1,600 MW. Primarily fueled with natural gas. Permitted to burn the base-load equivalent of 500 hr/ yr per turbine on ULSD.	Nitrogen Oxides (NOx)	Selective catalytic reduction; dry low-NOx; and wet injection	2.00	PPMVD @ 15% O2	GAS, 24-HR BLOCK, EXCLUDING SSM
DECORDOVA STEAM ELECTRIC STATION	DECORDOVA II POWER COMPANY LLC	TX	Paul Coon	3/8/2016	The DeCordova Station will consist of two combustion turbine generators (CTGs) operating in simple cycle or combined cycle modes. The gas turbines will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE). Simple cycle operations limited to 2,500 hr/ yr.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	
TENASKA PA PARTNERS/ WESTMORELAND GEN FAC	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/ hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/ hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/ 10/ 2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Nitrogen Oxides (NOx)	SCR, DLN, and good combustion practice	2.00	PPMVD@ 15% O2	
TENASKA PA PARTNERS/ WESTMORELAND GEN FAC	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/ hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/ hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/ 10/ 2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Nitrogen Oxides (NOx)	SCR, DLN, and good combustion practice	2.00	PPMVD@ 15% O2	
CRICKET VALLEY ENERGY CENTER	CRICKET VALLEY ENERGY CENTER LLC	NY		2/3/2016	Cricket Valley Energy Center LLC (CVEC) constructed the Cricket Valley Energy Center (the Facility), a nominal net 1,000-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located in Dover, Dutchess County, New York. The Facility consists of three General Electric (GE) Model 7FA.05 combustion turbine generators (CTGs) operating in combined-cycle mode with supplemental firing of the heat recovery steam generators (HRSGs); natural gas will be the sole fuel fired in the CTGs and duct burners. The Facility will include a natural gas-fired auxiliary boiler, four ultra-low sulfur distillate (ULSD) fired black-start generator engines and a ULSD-fired emergency fire pump engine. In addition to the air emitting equipment, the Facility will include three steam turbine generators (STGs), an air cooled condenser (ACC) and associated auxiliary equipment and systems. Each combined cycle generating unit consisting of the CTG, HRSG and STG will be exhausted through its own stack. Air emissions from the proposed Facility primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary combustion sources. Dutchess County is designated as in attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants with the exception of ozone. Based upon the potential to emit (PTE) estimates, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements for emissions of carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM) with a diameter equal to or less than 10 microns (PM10), PM with a diameter equal to or less than 2.5 microns (PM2.5); greenhouse gases (GHG); sulfuric acid mist (H2SO4); and volatile organic compounds (VOC). In accordance with the NYSDECs Nonattainment New Source Review (NNSR) permitting program, the Facility is also subject to NNSR for emissions of NOx and VOC.		Turbines and duct burners	15.21	natural gas	228	mw		Nitrogen Oxides (NOx)	dry low NOx burners in combination with selective catalytic reduction	2.00	PPMVD @ 15% O2	1 H
LACKAWANNA ENERGY CTR/ JESSUP	LACKAWANNA ENERGY CENTER, LLC	PA		12/23/2015	This plan approval is for the construction and temporary operation of three (3) identical General Electric Model 7HA.02 natural gas fired combustion turbines and heat recovery steam generator with duct burners (CT/ HRSG). Each CT/ HRSG combined-cycle process block includes one (1) combustion gas turbine and one (1) heat recovery steam generator with duct burners with all three (3) CT/ HRSG sharing one (1) steam turbine. The entire power block is rated at 1,500 MW. Additional equipment includes: one (1) 2,000 kW diesel-fired emergency generator one (1) 315 HP diesel-fired emergency fire water pump one (1) 184.8 MM BTU/ hr natural gas fired boiler one (1) 12 MMBTU/ hr natural gas fuel gas heater two (2) Diesel fuel storage tanks four (4) lubricating oil tanks one (1) aqueous ammonia storage tank		Combustion turbine with duct burner	15.21	Natural gas	3,304	MMBtu/ hr	Limits are for each CCCT and yearly limits are for cumulative turbine and duct burner. Duct burner throughput is 637.9 MMBtu/ hr.	Nitrogen Oxides (NOx)	Dry low-NOx burners, SCR, exclusive natural gas	2.00	PPMDV @15% O2	
CPV TOWANTIC, LLC	CPV TOWANTIC, LLC	CT	Andrew Bazinet	11/30/2015	805 MW Combined Cycle Power Plant		Combined Cycle Power Plant	15.21	Natural Gas	21,200,000	MMBtu/ 12 months		Nitrogen Oxides (NOx)	SCR	2.00	PPMVD @15% O2	1 HR BLOCK
CPV TOWANTIC, LLC	CPV TOWANTIC, LLC	CT	Andrew Bazinet	11/30/2015	805 MW Combined Cycle Plant		Combined Cycle Power Plant	15.21	Natural Gas	21,200,000	MMBtu/ yr		Nitrogen Oxides (NOx)	SCR	2.00	PPMVD @15% O2	1 HR BLOCK

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES - COLD STARTUP	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	153	LB/ EVENT	COLD STARTUP
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST. HEAT RATE LIMITED TO 6,793 BTU/ KWH (NET) AT ALL TIMES WHEN THE CTS/ HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR MATTAWOMAN TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS MATTAWOMAN PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	2.00	PPMVD @ 15% O2	3-HOUR BLOCK AVERAGE (EXCLUDING SU/ SD)
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES - WARM STARTUP	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	132	LB/ EVENT	WARM STARTUP
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES - HOT STARTUP	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	105	LB/ EVENT	HOT STARTUP
MATTAWOMAN ENERGY CENTER	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES - SHUTDOWN	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Nitrogen Oxides (NOx)	DRY LOW-NOX COMBUSTOR DESIGN, GOOD COMBUSTION PRACTICES AND SELECTIVE CATALYTIC REDUCTION (SCR)	23	LB/ EVENT	SHUT DOWN
FGE EAGLE PINES PROJECT	FGE EAGLE PINES, LLC	TX	Emerson Farrell	11/4/2015	The FGEEP Project will include three natural gas-fired combined cycle (NGCC) power blocks, each block comprised of two gas-fired combustion turbines, two supplemental fired duct burners (DBs) heat recovery steam generators (HRSGs), and one steam turbine. FGEEP selected Alstom GT36 combustion turbines (CTs), each nominally rated at 321 megawatts (MW). Each HRSG is equipped with DBs that will have a maximum design heat input capacity of 799 million British thermal units per hour (MMBtu/ hr). The CTs and DBs are fueled with pipeline quality natural gas. Each power block will also have a steam turbine generator designed to produce approximately 502 MW with the additional duct firing. Each of the three blocks will include the following ancillary equipment: one multi-cell condenser/ cooling tower, one emergency generator, one firewater pump, two diesel storage tanks, and pressurized aqueous ammonia storage tanks.		Combined Cycle Turbines (25 MW)	15.21	natural gas	321	MW	Alstom GT36 combustion turbines (321 MW)+ 799 million British thermal units per hour (MMBtu/ hr) duct burner	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	24-HR AVERAGE

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PSO COMANCHE POWER STATION	PUBLIC SERVICE COMPANY OF OKLAHOMA	OK	William Hildeson	10/8/2015	The facility is an electric utility plant, which burns natural gas to generate electricity. The Comanche Power Plant was constructed in 1971 and has operated continuously since that time without significant modification. The facility produces power using two Westinghouse gas combustion turbines(94 MW), Model W-501B, to supply a single steam turbine(120 MW). The turbines are fueled by Natural Gas and operate continuously.	American Electric Power (AEP) has requested a construction permit for their Comanche Power Station (SIC 4911, NAIC Code 221112) to install Dry Low-NOX burners (DLNB) to Units No. 1 and No. 2 to reduce emissions of NOX for the purpose of meeting Best Available Retrofit Technology (BART) requirements and Regional Haze Rule.	COMBINED CYCLE COMBUSTION TURBINE	15.21	NATURAL GAS	1,250	MMBTUH	Two (2) turbines without duct burner that support one (1) steam turbine.	Nitrogen Oxides (NOx)	Use of Dry Low NOx Burners	0.15	LB/ MMBTU	30-DAY ROLLING AVG
LON C. HILL POWER STATION	LON C. HILL, L.P.	TX	Matthew Lindsey	10/2/2015	The Lon C. Hill Power Station (LCHP) will include two natural gas-fired combined cycle combustion turbines (CTGs) equipped with dry low NOx burners (DLNs), heat recovery steam generators (HRSG), and natural gas-fired duct burners (DBs). Ancillary equipment includes evaporative coolers or inlet chillers, a single steam turbine (ST), auxiliary boiler, emergency generator, firewater pump, two cooling towers, oil water separator, degreaser, two diesel storage tanks, gasoline storage tank, selective catalytic reduction (SCR) and ammonia (NH3) handling systems including an NH3 storage tank, and two water tanks. The LCHP will be a 2x1 combined cycle power plant consisting of two CTGs, two HRSGs and one ST. The CTGs and ST will be one of two options: two Siemens SCC6-5000 CTGs and a SST6-5000 ST, or two General Electric 7FA CTGs and a D-11 ST.		Combined Cycle Turbines (25 MW)	15.21	natural gas	195	MW	Two power configuration options authorized Siemens " 240 MW + 250 million British thermal units per hour (MMBtu/ hr) duct burner GE " 195 MW + 670 MMBtu/ hr duct burner	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	ROLLING 24-HR AVERAGE
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined-cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine With Duct Burner	15.21	Natural Gas	3,727	MMBtu/ hr	DLN burner, SCR, Oxidation Catalyst and shall maintain and operate the sources and associated air cleaning devices in accordance with good engineering practice. shall install, certify, maintain and operate continuous emission monitoring systems (CEMS) for nitrogen oxides, carbon monoxide, carbon dioxide, and ammonia emissions on the exhaust of each combined-cycle powerblock. Emissions limits are for each combustion turbine/ duct burner block.	Nitrogen Oxides (NOx)	DLN burner, SCR, good engineering practice	2.00	PPMDV @ 15% O2	
MOXIE FREEDOM GENERATION PLANT	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined-cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DBs. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine without Duct Burner	15.21					Nitrogen Oxides (NOx)	DLN burners, SCR, good engineering practice	2.00	PPMDV @15% O2	
EAGLE MOUNTAIN STEAM ELECTRIC STATION	EAGLE MOUNTAIN POWER COMPANY LLC	TX	Paul Coon	6/18/2015	Eagle is proposing to construct two new combined cycle combustion turbines (CTG) which will generate electric power for sale on the wholesale electric market. The ancillary equipment includes an auxiliary boiler, a firewater pump, an emergency generator, a steam turbine, and various support facilities.		Combined Cycle Turbines (25 MW) " natural gas	15.21	natural gas	210	MW	Two power configuration options authorized Siemens " 231 MW + 500 million British thermal units per hour (MMBtu/ hr) duct burner GE " 210 MW + 349.2 MMBtu/ hr duct burner	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPM	ROLLING 24-HR AVERAGE

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SHELL CHEM APPALACHIA/ PETROCHEMICALS COMPLEX	SHELL CHEMICAL APPALACHIA	PA		6/18/2015	The plan approval will allow the construction and temporary operation of seven (7) 620 MMBtu/hr ethane cracking furnaces fired primarily by tail gas and natural gas for the production of approximately 1.5 million metric tons/year of polyethylene. Byproducts from the ethylene production include coke residue/tar, light gasoline, pyrolysis fuel oil, and a C3+ mixture and will be remove from the site for disposal or use as appropriate. Additional facilities include an electric and steam cogeneration from three (3) combustion turbines with duct burners and heat recovery steam generators with a plant capacity of 250.4 MW, four (4) emergency generators, three (3) diesel-fired fire pump engines, cooling towers, flares, and storage tanks.	(7) 620.000 MMBtu/hr Ethane cracking furnaces, (3) 664.000 combustion turbines with duct burners. Shell intends to convert ethane in to ethylene for manufacturing of various grades of low density and high density polyethylene as a final product.	Combustion turbine wih duct burner and heat recovery steam generator	15.21	Natural Gas	0	Three 40.6 MW turbines	Three (3) General Electric Frame 6B NG fired turbine with duct burners and heat recovery steam generators. Total electric generating capacity will be 250.4 MW from cogeneration three turbines at 40.6 MW and two HRSG at 64.3 MW. Excess electricity generated will be sold to the grid in quantities sufficient to classify the facility as an electric utility.	Nitrogen Oxides (NOx)		2.00	PPMDV @ 15% O2	1 HOUR AVG EX DURING STARTUP AND SHUTDOW
YORK ENERGY CENTER BLOCK 2 ELECTRICITY GENERATION PROJECT	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/ USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/ yr with duct firing; 480 hr/ yr of ULSD		Two Combine Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	3,002	MCF/ hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/ hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/ hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. . (Operational limits are for each CCCT NG-fired with duct burner)	Nitrogen Oxides (NOx)	SCR, Dry Lo-NOx combustor, good combustion practices and low sulfur fuels	2.00	PPVDM @ 15 O2	
CASH CREEK GENERATING STATION	CASH CREEK GENERATION, L.L.C	KY	Mike Mcinnus	6/10/2015	natural gas fired combined cycle power plant		Combined cycle combustion turnbine with HRSG and duct firing	15.21	Natural gas pipeline quality	849	MW	Two CT with HRSGs with duct burner Max fuel input for CTs and HRSGs 6,714 mmBtu/hr HHV Max Gross output 849 MW at 0F	Nitrogen Oxides (NOx)	SCR, low NOx burners	2.00	PPMVD	@15% O2 THREE HOUR ROLLING AVERAGE
COLORADO BEND ENERGY CENTER	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Nitrogen Oxides (NOx)	SCR and oxidation catalyst	2.00	PPMVD @ 15% O2	24-HR AVERAGE
S R BERTRON ELECTRIC GENERATING STATION	NRG TEXAS POWER LLC	TX	Craig Eckberg	12/19/2014	NRG Texas is proposing to construct an additional electric power generation station at the Bertron Power Project which will generate electric power for sale on the wholesale electric market. The Bertron Power Project will include two power blocks that can be operated in combined cycle mode.		(2) combined cycle turbines	15.21	natural gas	240	MW	The gas turbines will be one of three options: (1) Two Siemens Model F5 (SF5) CTGs each rated at nominal capability of 225 megawatts (MW). Each CTG will have a duct fired HRSG with a maximum heat input of 688 million British thermal units per hour (MMBtu/ hr). (2) Two General Electric Model 7FA (GE7FA) CTGs each rated at nominal capability of 215 MW. Each CTG will have a duct fired HRSG with a maximum heat input of 523 MMBtu/ hr. (3) Two Mitsubishi Heavy Industry G Frame (MHI501G) CTGs each rated at a nominal electric output of 263 MW. Each CTG will have a duct fired HRSG with a maximum heat input of 686 MMBtu/ hr.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% O2, 24-HR ROLLING AVERAGE
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	12/11/2014	Electric generation	Permit modification to convert startup and shutdown BACT limits to an hourly basis (from event based).	Four combined cycle combution turbines	15.21	natural gas	373	MMBTU/ H each	GE, LM6000 PF, natural gas fired, combined cycle combustion turbines, with HRSG and no duct burners.	Nitrogen Oxides (NOx)	SCR and dry low NOx burners	8.00	LB/ H	4-HR ROLLING AVE / STARTUP AND SHUTDOWN
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	12/11/2014	Electric generation	Permit modification to convert startup and shutdown BACT limits to an hourly basis (from event based).	Four combined cycle combustion turbines	15.21	natural gas	373	MMBTU/ H each	GE, LM6000 PF, natural gas fired, combined cycle combustion turbines, with HRSG and no duct burners.	Nitrogen Oxides (NOx)	SCR and dry low NOx burners	8.00	LB/ H	4-HR ROLLING AVE / STARTUP AND SHUTDOWN
VICTORIA POWER STATION	VICTORIA WLE L.P.	TX	Gary Clark	12/1/2014	The facility is currently authorized under Standard Permit No. 80878 and several Permits by Rule (PBR), including §106.263 for maintenance, startup, and shutdown (MSS) (PBR Registration No. 94387) and Title V Permit No. O-35. Victoria proposes to install an additional natural gas-fired turbine (GT) and HRSG with duct burners at the Victoria Station. The resulting new facility will be a combined cycle generating facility in a 2x2x1 configuration (two combustion turbines, two HRSGs with duct burners, and one steam turbine).		combined cycle turbine	15.21	natural gas	197	MW	General Electric 7FA.04 at 197 MW nominal output. The duct burners will be capable of a maximum natural gas firing rate of up to 483 MMBtu/ hr (HHV). The duct burners may be fired additional hours; however, total annual firing will not exceed the equivalent of 4,375 hours at maximum capacity per duct burner. The available capacity of the existing steam turbine will be increased from 125 MW in its existing 1x1x1 configuration to approximately 185 MW in the 2x2x1 configuration.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% O2, 24-HR ROLLING AVERAGE
MOUNDSVILLE COMBINED CYCLE POWER PLANT	MOUNDSVILLE POWER, LLC	WV	Jon Williams	11/21/2014	Nominal 549 mW(output) natural gas-fired combined cycle power plant.		Combined Cycle Turbine/ Duct Burner	15.21	Natural Gas	2,420	MMBtu/ Hr	This entry is for both of two identical units at the facility. Nominal 197 mW General Electric Frame 7FA.04 Turbine w/ Duct Burner - throughput denotes aggregate heat input of turbine and duct burner (HHV).	Nitrogen Oxides (NOx)	SCR & Dry Low-NOx Burners	15	LB/ H	

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
TRINIDAD GENERATING FACILITY	SOUTHERN POWER COMPANY	TX	Kelli Mccullough	11/20/2014	Southern Power Company (SPC) is proposing to construct an electric generating facility near Trinidad, Henderson County, Texas. The Trinidad Generating Facility (TGF) will include a natural gas-fired combined cycle combustion turbine generator (CTG) equipped with heat recovery steam generator (HRSG) and duct burners (DB).		combined cycle turbine	15.21	natural gas	497	MW	The facility will consist of a Mitsubishi Heavy Industries (MHI) J model gas fired combustion turbine nominally rated at 497 megawatts (MW) equipped with a HRSG and DB with a maximum design capacity of 402 million British thermal units per hour (MMBtu/ hr). The gross nominal output of the CTG with HRSG and DB is 530 MW.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% 02, 24-HR ROLLING AVERAGE
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS. HEAT INPUT LIMITED TO 6,802 BTU/ KWH (NET) AT ALL TIMES WHEN THE CTS/ HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR KEYS TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS KEYS PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION	2.00	PPMVD @ 15% 02	3-HOUR BLOCK AVERAGE, EXCLUDING SU/ SD
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES - COLD STARTUP	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS.	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	245	LB/ EVENT	COLD STARTUP
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES - WARM STARTUP	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS.	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	83	LB/ EVENT	WARM STARTUP
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES - HOT STARTUP	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS.KEYS IS PROHIBITED FROM OPERATING BOTH CTS IN A CONCURRENT STARTUP MODE. ADDITIONALLY, THE START-UP OF A SECOND CT SHALL NOT COMMENCE UNTIL THE START-UP OF THE FIRST CT IS COMPLETE.	Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES, DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION	71	LB/ EVENT	HOT STARTUP
KEYS ENERGY CENTER	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES - SHUTDOWN	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS.	Nitrogen Oxides (NOx)	DRY LOW-NOX COMBUSTOR DESIGN, GOOD COMBUSTION PRACTICES AND SELECTIVE CATALYTIC REDUCTION	60	LB/ EVENT	SHUTDOWN

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
CEDAR BAYOU ELECTRIC GENERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	8/29/2014	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the combined cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The new units will produce between 215-263 MW each.		Combined cycle natural gas turbines	15.21	Natural Gas	225	MW		Nitrogen Oxides (NOx)	DLN, SCR	2.00	PPM	24HR ROLLING AVG.
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/ LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine without Duct Burner	15.21	Natural Gas	20,282	MMCF/ YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMBtu/ hr (HHV) Heat Input rate of the Duct burner= 777 MMBtu/ hr(HHV) The fuel use of 20,282 MMCF/ YR is for three turbines and three Duct burner.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction System (SCR) and use of natural gas a clean burning fuel	2.00	PPMVD @ 15%O2	3-HR ROLLING AVE BASED ON 1-HR BLOCK
WEST DEPTFORD ENERGY STATION	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/ LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	20,282	MMCF/ YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMBtu/ hr (HHV) Heat Input rate of the Duct burner= 777 MMBtu/ hr(HHV) The fuel use of 20,282 MMCF/ YR is for three turbines and three Duct burners.	Nitrogen Oxides (NOx)	Selective Catalytic reduction (SCR) and use of natural gas a clean burning fuel	23	LB/ H	3-HR ROLLING AVE BASED ON 1-HR BLOCK
FREEPORT LNG PRETREATMENT FACILITY	FREEPORT LNG DEVELOPMENT LP	TX	Ruben Velasquez	7/16/2014	In support of the proposed Liquefaction Plant pending TCEQ review under Air Quality Permit Nos. 100114, PSDTX1282, and N150, Freeport LNG plans to construct a natural gas Pretreatment Facility to purify pipeline quality natural gas to be sent to the Liquefaction Plant for the production of LNG. The Pretreatment Facility will be located approximately 3.5 miles inland to the northeast of the Quintana Island Terminal along Freeport LNGs existing 42-inch natural gas pipeline route. Pipeline quality natural gas will be delivered from interconnecting intrastate pipeline systems through Freeport LNG Developments existing Stratton Ridge meter station. The gas will be pretreated in the Pretreatment Facility to remove carbon dioxide, sulfur compounds, water, mercury, BTEX, and natural gas liquids. The pre-treated natural gas will then be delivered to the Liquefaction Plant through Freeport LNGs existing 42-inch gas pipeline.		Combustion Turbine	15.21	natural gas	87	MW	The exhaust heat from the turbine will be used to heat a heating medium which is used to regenerate rich amine from the acid gas removal system.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	15@ O2, 3 HOUR ROLLING AVERAGE
COVE POINT LNG TERMINAL	DOMINION COVE POINT LNG, LP	MD	Richard B. Gangle	6/9/2014	LIQUIFIED NATURAL GAS PROCESSING FACILITY AND 130 MEGAWATT GENERATING STATIONFACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	2 COMBUSTION TURBINES	15.21	NATURAL GAS	130	MW	TWO GENERAL ELECTRIC (GE) FRAME 7EA COMBUSTION TURBINES (CTS) WITH A NOMINAL NET 87.2 MEGAWATT (MW) RATED CAPACITY, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), EQUIPPED WITH DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR), AND OXIDATION CATALYST	Nitrogen Oxides (NOx)	USE OF DRY LOW-NOX COMBUSTOR TURBINE DESIGN (DLN1), USE OF FACILITY PROCESS FUEL GAS AND PIPELINE NATURAL GAS DURING NORMAL OPERATION AND SCR SYSTEM	2.50	PPMVD @ 15% O2	3-HOUR BLOCK AVERAGE, EXCLUDING SU/SD
TENASKA BROWNSVILLE GENERATING STATION	TENASKA BROWNSVILLE PARTNERS, LLC	TX	Larry Carlson	4/29/2014	Tenaska proposes a new electric power plant, using combined cycle gas turbine (CCGT) technology and fueled by pipeline quality natural gas. The proposed permit authorizes two CTs (2x1 CCGT), although the final design selected by Tenaska may only consist of one CT (1x1 CCGT).		(2) combined cycle turbines	15.21	natural gas	274	MW	Each CTG is site-rated at 274 MW gross electric output at 62°F ambient temperature. At this condition, two HRSGs with full duct burner firing produce enough steam to generate an additional 336 MW, for a total of 884 MW gross, or with about 5% losses, about 840 MW net electric output. Under summertime conditions, the net output is approximately 800 MW with the 2x1 CCGT configuration or about 400 MW with the 1x1 CCGT configuration.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% O2, 24-HR ROLLING AVERAGE
CPV ST. CHARLES	CPV MARYLAND, LLC	MD	Donald Atwood	4/23/2014	725 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/ YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/ YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/ YR	FACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/ YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/ YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/ YR	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	725	MEGAWATT	TWO GENERAL ELECTRIC (GE) F-CLASS ADVANCED COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 725 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Nitrogen Oxides (NOx)	DRY LOW-NOX COMBUSTOR DESIGN AND SELECTIVE CATALYTIC REDUCTION (SCR)	2.00	PPMVD @ 15% O2	3-HOUR BLOCK AVERAGE, EXCLUDING SU/ SD
MARSHALLTOWN GENERATING STATION	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #1 - combined cycle	15.21	natural gas	2,258	mmBtu/ hr	two identical Siemens SGT6-5000F combined cycle turbines without duct firing, each at 2258 mmBtu/ hr generating approx. 300 MW each.	Nitrogen Oxides (NOx)	Low-NOx burners and SCR	2.00	PPM	30-DAY ROLLING AVG. @15% O2
MARSHALLTOWN GENERATING STATION	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #2 - combined cycle	15.21	natural gas	2,258	mmBtu/ hr		Nitrogen Oxides (NOx)	SCR, Low-NOx burner	2.00	PPM	30-DAY ROLLING AVERAGE

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WILDCAT POINT GENERATION FACILITY	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/ YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/ YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/ YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/ YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/ YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/ YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/ YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/ YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITH DUCT FIRING	15.21	NATURAL GAS	1,000	MW	TWO MITSUBISHI G MODEL COMBUSTION TURBINE GENERATORS (CTS) WITH A NOMINAL GENERATING CAPACITY OF 270 MW CAPACITY EACH, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR), OXIDATION CATALYST	Nitrogen Oxides (NOx)	USE OF DRY LOW-NOX COMBUSTOR TURBINE DESIGN , USE OF PIPELINE QUALITY NATURAL GAS DURING NORMAL OPERATION AND SCR SYSTEM	2.00	PPMVD @ 15% O2	3-HOUR BLOCK AVERAGE, EXCLUDING SU/ SD
FGE TEXAS POWER I AND FGE TEXAS POWER II	FGE POWER LLC	TX	Emerson Farrell	3/24/2014	Electric Generating Utility	TCEQ Permit No. 110025	Alstom Turbine	15.21	Natural Gas	231	MW	Four (4) Alstom GT24 CTGs, each with a HRSG and DBs, max design capacity 409 MMBtu/ hr	Nitrogen Oxides (NOx)	Selective catalytic reduction	2.00	PPMVD	CORRECTED TO 15% O2, ROLLING 24 HR AVE
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/ hr(HHV) with a 62.1 duct burner MMBtu/ hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/ hr(HHV) with a 164.4 duct burner MMBtu/ hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	Combined Cycle Combustion Turbine -Siemens turbine without Duct Burner	15.21	Natural gas	33,691	MMCF/ YR	Natural Gas Usage <= 33,691 MMft^3/ yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each Siemens combustion turbine will be 2,356 MMBtu/ hr(HHV)	Nitrogen Oxides (NOx)	Selective Catalytic Reduction and Dry Low NOx	2.00	PPMVD@ 15% O2	3-HR ROLLING AVE BASED ON 1-HR BLOCK
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/ hr(HHV) with a 62.1 duct burner MMBtu/ hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/ hr(HHV) with a 164.4 duct burner MMBtu/ hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - SIEMENS	15.21	Natural Gas	33,691	MMCF/ YR	Natural Gas Usage <= 33,691 MMft^3/ yr per 365 consecutive day period, rolling one day basis (per two Siemens turbines and two associated duct burners) The heat input rate of the Siemens turbine will be 2,356 MMBtu/ hr(HHV) with a 62.1 duct burner MMBtu/ hr(HHV).	Nitrogen Oxides (NOx)	Selective Catalytic Reduction System (SCR)	2.00	PPMVD	3-HR ROLLING AVE BASED ON 1-HR BLOCK AVE
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/ hr(HHV) with a 62.1 duct burner MMBtu/ hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/ hr(HHV) with a 164.4 duct burner MMBtu/ hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - GENERAL ELECTRIC	15.21	Natural gas	33,691	MMCF/ YR	Natural Gas Usage <= 33,691 MMft^3/ yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion each turbine will be 2,312 MMBtu/ hr(HHV) with a 164.4 MMBtu/ hr duct burner	Nitrogen Oxides (NOx)	Selective Catalytic Reduction Systems(SCR) and Dry Low NOx	2.00	PPMVD @ 15%O2	3-HR BLOCK AVERAGE BASED ON 1-HR BLOCK
PSEG FOSSIL LLC SEWAREN GENERATING STATION	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/ hr(HHV) with a 62.1 duct burner MMBtu/ hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/ hr(HHV) with a 164.4 duct burner MMBtu/ hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITHOUT DUCT BURNER - GENERAL ELECTRIC	15.21	Natural Gas	33,691	MMCF/ YR	Natural Gas Usage <= 33,691 MMft^3/ yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion turbine will be 2,312 MMBtu/ hr(HHV)	Nitrogen Oxides (NOx)	Selective Catalytic Reduction System (SCR) and Dry Low NOx	2.00	PPMVD @ 15%O2	3-HR ROLLING AVERAGE BASED ON 1-HR BLOCK
TROUTDALE ENERGY CENTER, LLC	TROUTDALE ENERGY CENTER, LLC	OR	Willard Ladd	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		Mitsubishi M501-GAC combustion turbine, combined cycle configuration with duct burner.	15.21	natural gs	2,988	MMBTU/ H	or ULSD; Duct burner 499 MMBtu/ hr, natural gas	Nitrogen Oxides (NOx)	Utilize dry low-NOx burners when combusting natural gas; Utilize water injection when combusting ULSD; Utilize selective catalytic reduction (SCR) with aqueous ammonia injection at all times except during startup and shutdown; Limit the time in startup or shutdown.	2.00	PPMDV AT 15% O2	3-HR ROLLING AVERAGE ON NG
FUTURE POWER PA/ GOOD SPRINGS NGCC FACILITY	FUTURE POWER PA INC	PA	James Palumbo	3/4/2014	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 346 MW nominal, using a combustion turbine generator and a heat recovery steam generator that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The Turbine is rated at 2,267 MMBTU/ hr HHV (2,042 MMBTU/ hr LHV). The Duct burner is rated at 134.3 MMBTU/ hr HHV (120 MMBTU/ hr LHV). The proposed project will also include a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other plant equipment.		Turbine, COMBINED CYCLE UNIT (Siemens 5000)	15.21	Natural Gas	2,267	MMBTU/ H		Nitrogen Oxides (NOx)	SCR	2.00	PPMVD	@ 15% OXYGEN

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SALEM HARBOR STATION REDEVELOPMENT	FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP	MA	Scott Silverstein	1/30/2014	Footprint Power Salem Harbor Development LP (the Permittee) proposes to construct and operate a nominal 630 Megawatt (MW) natural gas fired, quick start (capable of producing 300 MW within 10 minutes of startup) combined cycle electric generating facility (the Facility) at Salem Harbor Station. With duct firing, the proposed Facility will be capable of generating an additional 62 MW, for a total of 692 MW. Emission units include two 315 MW (nominal) GE Model 107F Series 5 combustion turbine generators, each with dedicated heat recovery steam generator, duct burner and 31 MW (estimated) steam turbine generator, dispatchable independently of one another by ISO-NE; one 80 MMBtu/ hr auxiliary boiler, one 750 kW emergency engine-generator, and one 371 bhp emergency engine-fire-pump.	separate PSD permit under delegated program, and CPA approval (including nonattainment major NSR for NOx as ozone precursor, and state minor NSR for other pollutants) other facility-wide emission limits (not listed in next section): GHG(CO2e): 2,279,530 TPY CO2: 2,277,333 TPY H2SO4: 19.0 TPY	Combustion Turbine with Duct Burner	15.21	Natural Gas	2,449	MMBTU/ H	two 315 MW (nominal) GE Energy 7F Series 5 Rapid Response Combined Cycle Combustion Turbines with Duct Burners and 31 MW (estimated) steam turbine generators	Nitrogen Oxides (NOx)	Dry Low NOx Combustors & Selective Catalytic Reduction	2.00	PPMVD @ 15% O2	1 HR BLOCK AVG/ DO NOT APPLY DURING SS
BERKS HOLLOW ENERGY ASSOC LLC/ ONTELAUNEE	BERKS HOLLOW ENERGY ASSOC LLC	PA	Bradley J Cooley	12/17/2013	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	Turbine, Combined Cycle, #1 and #2	15.21	Natural Gas	3,046	MMBTU/ H	Equipped with SCR and Oxidation Catalyst	Nitrogen Oxides (NOx)	SCR	132	TPY	12-MONTH ROLLING TOTAL
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct burners	15.21	natural gas	647	MMBTU/ H for each CTGHRSG	This process is identified in the permit as FGCTGHRSG; it is 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSGs) equipped with duct burners for supplemental firing (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. Each CTGHRSG shall not exceed 647 MMBtu/ hr on a fuel heat input basis.	Nitrogen Oxides (NOx)	SCR with DLNB (selective catalytic reduction with dry low NOx burners).	3.00	PPM	24-H ROLL.AVG. NOT STARTUP/ SHUTDOWN
HOLLAND BOARD OF PUBLIC WORKS - EAST 5TH STREET	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: Startup Shutdown	15.21	natural gas	647	MMBTU/ H for each CTGHRSG	This process is identified separately for the startup and shutdown periods associated with the process equipment included in FG-CTGHRSG.	Nitrogen Oxides (NOx)	SCR with DLNB (selective catalytic reduction with dry low NOx burners).	44	LB/ H	OPERATING HOUR DURING STARTUP
PINECREST ENERGY CENTER	PINECREST ENERGY CENTER LLC	TX	Kathleen Smith	11/12/2013	Combined Cycle Electric Generating Plant	103839	combined cycle turbine	15.21	natural gas	700	MW	The generating equipment consists of two natural gas-fired combustion turbines (CTs), each exhausting to a fired heat recovery steam generator (HRSG) to produce steam to drive a shared steam turbine generator. The steam turbine is rated at 271 MW of electric output. Three models of combustion turbines are being considered for this site: the General Electric 7FA.05, the Siemens SGT6-5000F(4), and the Siemens SGT6-5000F(5). The final selection of the combustion turbine will not be made until after the permit is issued. Plant output will range between 637 and 735 MW, depending on the model turbine selected. Duct Burners are rated at 750 MMBtu/ hr each.	Nitrogen Oxides (NOx)	selective catalytic reduction	2.00	PPMVD	24-HR ROLLING AVG, 15% OXYGEN
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Natural gas fueled combined cycle combustion turbine generators (CTG)	15.21	Natural Gas	2,147	MMBTU/ H	FG-CTG1-4: Four natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. Two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner, a selective catalytic reduction (SCR) system, and a catalytic oxidation system. The throughput capacity is 2,147 MMBtu/ hr for each CTG. The turbines are existing simple cycle turbines that will be retrofit to be combined cycle units.	Nitrogen Oxides (NOx)	Dry Low NOx burners (DLN) and Selective Catalytic Reduction (SCR) system.	2.00	PPMVOL	3-H ROLL AVG., EXCEPT STARTUP/ SHUTDOWN

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG/ DB1-4 Natural gas fueled combined cycle combustion turbine generators; duct burner on HRSG	15.21	Natural gas	2,807	MMBTU/ H	Four natural gas-fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system, and a catalytic oxidation system. Additionally, the HRSG is operated with a natural gas fired duct burner during supplemental firing. The turbines are existing simple cycle turbines which will be retrofit to be combined cycle. Operational restriction is 4000 hrs/ year that each DB can operate.	Nitrogen Oxides (NOx)	Dry low NOx burner (DLN) and selective catalytic reduction system (SCR).	2.00	PPMVOL	3-H ROLL AVG., EXCEPT STARTUP/ SHUTDOWN
RENAISSANCE POWER LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Startup/ Shutdown	15.21	Natural gas	2,147	MMBTU/ H	Four natural gas-fired CTGs operating in startup/ shutdown mode.	Nitrogen Oxides (NOx)	Dry low NOx burners (DLN) and selective catalytic reduction (SCR) system.	177	PPH	EACH CTG W/O DB; HR LIMIT DURING STARTUP
MORGAN CITY POWER PLANT	LOUISIANA ENERGY AND POWER AUTHORITY (LEPA)	LA		9/26/2013			Combustion Turbine with SCR/ HRSG	15.21	Natural Gas	607	MMBTU/ hr		Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) and Water/ Steam Injection	12	LB/ H	HOURLY MAXIMUM
SAND HILL ENERGY CENTER	CITY OF AUSTIN	TX	Joseph Ravi	9/13/2013	GE 7FA Natural Gas-fired Combined Cycle Turbine with DB fired HRSG		Natural gas-fired combined cycle turbines	15.21	Natural Gas	174	MW		Nitrogen Oxides (NOx)	SCR	2.00	PPM	24HR ROLLING AVG.
BAYPORT COMPLEX	AIR LIQUIDE LARGE INDUSTRIES U.S., L.P.	TX	Jason Miller	9/5/2013	Air Liquid currently operates a cogeneration facility in Pasadena, Texas (Bayou Cogeneration Plant). The permit amendment submitted by Air Liquide will authorize a redevelopment project of its cogeneration plant. The proposed project will involve the replacement of four existing gas-fired turbines (GE 7EA) with similar gas-fired turbines (GE 7EA), the addition of three new gas-fired boilers rated at 550 MMBtu/ hr and the removal of three existing gas-fired boilers rated at 443 MMBtu/ hr.		(4) cogeneration turbines	15.21	natural gas	90	MW	(4) GE 7EA turbines providing power and process steam	Nitrogen Oxides (NOx)	DLN and Closed Loop Emissions Controls (CLEC)	5.00	PPMVD	@15% O2, 3-HR ROLLING AVERAGE
CPV VALLEY ENERGY CENTER	CPV VALLEY LLC	NY		8/1/2013	CPV Valley Energy Center is a 680 MW combined cycle electric generating facility located in Middletown, NY. The combustion turbines are rated at 2,234 MMBTU/ H firing natural gas and 2,145 MMBTU/ H firing diesel fuel. The duct burners are rated for 500 MMBTU/ H firing natural gas. In addition to the turbines their emission limits for the auxiliary boiler (73.5 MMBTU/ H), emergency generator, fire pump, and gas heater.	State Facility Permit	Turbines and duct burners - NG	15.21	natural gas			Combined cycle units heat rate 7,605 BTU/ KW-H (HHV) or less without duct burner firing to achieve design thermal efficiency of 57.4% (LHV).	Nitrogen Oxides (NOx)	Dry low NOx combustion technology and selective catalytic reduction.	2.00	PPMVD @ 15% O2	1 H

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/ HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/ hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	15.21	natural gas	2,587	MMBTU/ H heat input, each CTG	Natural gas fired CTG with DB for HRSG; 4 total. Technology A (4 total) is 2587 MMBTU/ H design heat input each CTG. Technology B (4 total) is 2688 MMBTU/ H design heat input each CTG. Permit was issued for either of two F Class turbine technologies with slight variations in emission rates. Applicant will select one technology. Installation is two separate CTG/ HRSG trains driving one steam turbine electrical generator; Two 2X1 Blocks. Each CTG will be rated at 211 to 230 MW (gross) output and the station nominal generating capacity will be up to 1,400 MW.	Nitrogen Oxides (NOx)	Low NOx burners and selective catalytic reduction.	3.00	PPMV	24-H ROLLING AVERAGE
MOORELAND GENERATING STA	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFECs system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/ 4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are considered œgrandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	Combustion Turbine	15.21	Natural Gas	360	MW	This process represents the GE option for the project - One GE 7FA.05 natural gas-fired combustion turbine generator with an 820.5 MMBTUH duct burner.	Nitrogen Oxides (NOx)	Dry Low-NOx burners with SCR.	2.00	PPMVD @ 15% O2	ONE-HR
MOORELAND GENERATING STA	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFECs system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/ 4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are considered œgrandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	COMBUSTION TURBINE	15.21	NATURAL GAS	360	MW	This process represents the Siemens option for the project - One Siemens SGT6-5000F5 natural gas-fired combustion turbine generator with an 820.3 MMBTUH duct burner.	Nitrogen Oxides (NOx)	DRY LOW-NOx BURNER WITH SCR.	2.00	PPMVD @ 15% O2	ONE-HR
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, without duct burners	15.21	Natural Gas	515,600	MMSCF/ rolling 12-months	Two Mitsubishi 2932 MMBtu/ H combined cycle combustion turbines , both with 300 MMBtu/ H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Nitrogen Oxides (NOx)	selective catalytic reduction (SCR); dry low NOx combustors; lean fuel technology	22	LB/ H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, with duct burners	15.21	Natural Gas	51,560	MMSCF/ rolling 12-MO	Two Siemens 2932 MMBtu/ H combined cycle combustion turbines , both with 300 MMBtu/ H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Nitrogen Oxides (NOx)	selective catalytic reduction (SCR); dry low NOx combustors; lean fuel technology	21	LB/ H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, without duct burners	15.21	Natural Gas	47,917	MMSCF/ rolling 12-MO	Two Mitsubishi 2932 MMBtu/ H combined cycle combustion turbines , both with 300 MMBtu/ H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Nitrogen Oxides (NOx)	selective catalytic reduction (SCR); dry low NOx combustors; lean fuel technology	23	LB/ H	
OREGON CLEAN ENERGY CENTER	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, with duct burners	15.21	Natural Gas	47,917	MMSCF/ rolling 12-MO	Two Mitsubishi 2932 MMBtu/ H combined cycle combustion turbines , both with 300 MMBtu/ H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Nitrogen Oxides (NOx)	selective catalytic reduction (SCR); dry low NOx combustors; lean fuel technology	21	LB/ H	

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
GREEN ENERGY PARTNERS/ STONEWALL, LLC	GREEN ENERGY PARTNERS/ STONEWALL, LLC	VA	John Andrews	4/30/2013	Green Energy Partners / Stonewall, LLC has proposed to construct and operate a combined-cycle electric power generating facility in Loudoun County with a nominal generating capacity of 750 megawatts (MW). The proposed facility is comprised of two combustion turbine generators each having a heat recovery steam generator (HRSG) driving a common steam turbine. Each HRSG has a duct burner for supplemental firing. The facility also includes an auxiliary boiler, an emergency fire water pump, an emergency generator and a fuel gas heater.	GEP/ S has requested that the proposed permit allow two optional plant configurations, each having a different combustion turbine manufacturer. The two combustion turbine configuration options currently being considered are the General Electric GE7FA.05 and Siemens SGT6-5000F5 units. The proposed CT generators will either be General Electric GE7FA.05 or Siemens SGT6-5000F5 units. The facility wide pollutant emissions listed are based on the GE F7FA.05 Combustion Turbines & HRSGs with DBs on. PM=PM-10. Emissions for PM-2.5 = 98.1 T/ Yr. Emissions for the Siemens SGT6-5000F5 Combustion Turbines & HRSGs with DBs on: Carbon Monoxide: 143.6 Nitrogen Oxides: 164.9	Large combustion turbines (25MW) CCT1 and CCT2	15.21	Natural Gas	2	MMBTU/ H	Throughput and Units above are for the GEF7.05. Siemens SGTF-5000F5: Throughput: 2.260 MMBTU/ hr	Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR), with ammonia injection and dry low NOx combustion.			
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG	15.21	Natural gas	2,237	MMBTU/ H	Throughput is 2,237 MMBTU/ H for each CTG Equipment is permitted as following flexible group (FG): FG-CTG1-2: Two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system.	Nitrogen Oxides (NOx)	Dry low NOx (DLN) burner and selective catalytic reduction (SCR) system.	2.00	PPM	EACH CTG; 24-H ROLLING AVG.
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG and duct burner (DB)	15.21	Natural gas	2,486	MMBTU/ H	This process is permitted in a flexible group format, identified in the permit as FG-CTG/ DB1-2 and is for two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. Additionally, the HRSG is operating with a natural gas fired duct burner for supplemental firing. The throughput is 2,486 MMBTU/ H for each CTG/ DB.	Nitrogen Oxides (NOx)	Dry low NOx (DLN) burners and selective catalytic reduction (SCR) system.	2.00	PPM	24-H ROLLING AVG
MIDLAND COGENERATION VENTURE	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG--Startup/ Shutdown	15.21	Natural gas	2,237	MMBTU/ H each	Two (2) natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. This entry is for the startup/ shutdown operations.	Nitrogen Oxides (NOx)	Dry low NOx (DLN) burner and selective catalytic reduction (SCR)	186	LB/ H	HOURLY DURING STARTUP
HICKORY RUN ENERGY STATION	HICKORY RUN ENERGY LLC	PA	David Wilson	4/23/2013	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 900 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The project will also include a natural gas fired auxiliary boiler; a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other balance of plant equipment.		COMBINED CYCLE UNITS #1 and #2	15.21	Natural Gas	3	MMCF/ HR	The Permittee shall select and install any of the turbine options listed below (or newer versions of these turbines if the Department determines that such newer versions achieve equivalent or better emissions rates and exhaust parameters) 1. General Electric 7FA (GE 7FA) 2. Siemens SGT6-5000F (Siemens F) 3. Mitsubishi M501G (Mitsubishi G) 4. Siemens SGT6-8000H (Siemens H) The emissions listed are for the Siemens SGT6-8000H unit.	Nitrogen Oxides (NOx)	SCR	2.00	PPMVD @ 15% O2	WITH OR WITHOUT DUCT BURNER

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SUNBURY GENERATION LP/ SUNBURY SES	SUNBURY GENERATION LP	PA	Mark Crawford	4/1/2013	This plan approval is for the repowering of the Sunbury Generation facility. This project will be for the construction of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners. The project will also be for the construction of a natural gas fired auxiliary boiler to assist with startup and shutdown activities and a small natural gas fired dew point heater. As part of the project all of the facility's existing coal fired utility boilers will be permanently retired.		Combined Cycle Combustion Turbine AND DUCT BURNER (3)	15.21	Natural Gas	2,538,000	MMBTU/ H	Three powerblocks consisting of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners.	Nitrogen Oxides (NOx)	SCR	2.00	PPM	CORRECTED TO 15% OXYGEN
BRUNSWICK COUNTY POWER STATION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Jeffrey Zehner	3/12/2013	New, combined-cycle, natural gas-fired, electrical power generating facility.		COMBUSTION TURBINE GENERATORS, (3)	15.21	Natural Gas	3,442	MMBTU/ H	Three (3) Mitsubishi M501 GAC combustion turbine generators with HRSG duct burners (natural gas-fired).	Nitrogen Oxides (NOx)	Selective catalytic reduction and ultra low NOx burners.	2.00	PPMVD @ 15% O2	1 H AVG
LA PALOMA ENERGY CENTER	LA PALOMA ENERGY CENTER, LLC	TX	Gary Neus	2/7/2013	The proposed project is a new electric power plant, fueled by pipeline quality natural gas. The design of the plant is standard combined cycle (CC) technology.		(2) combined cycle turbines	15.21	natural gas	650	MW	The specific equipment includes two combustion turbines (CTs) connected to electric generators, producing between 183 and 232 MW of electricity, depending on ambient temperature and the selected CT. The two HRSGs use duct burners rated at 750 MMBtu/ hr each to supplement the heat energy from the CTs. The steam from the two HRSGs is combined and routed to a single steam turbine driving a third electric generator with an electricity output capacity of 271 MW. Depending on the selected CT, total plant output at 59°F is between 637 MW and 735 MW. The applicant is considering three models of CT; one model will be selected and the permit revised to reflect the selection before construction begins. The three CT models are: (1) General Electric 7FA.04; (2) Siemens SGT6-5000F(4); or (3) Siemens SGT6-5000F(5).	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% 02, 24-HR ROLLING AVERAGE
MOXIE ENERGY LLC/ PATRIOT GENERATION PLT	MOXIE ENERGY LLC	PA	Kent Morton	1/31/2013	This plan approval is for the construction of two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner. The two powerblocks constructed pursuant to this plan approval will be either the two powerblocks rated 472 megawatts (MW) (P101 and P102) or the powerblocks rated 458 MW (P103 and P104). Additionally, this plan approval is for the construction of a 1464 bhp diesel-fired emergency generator, 460 bhp diesel fired fire pump, 1600 gallon diesel tank, 300 gallon diesel tank, two 15,000 gallon (each) lube oil tanks and ancillary electrical equipment.		Combined Cycle Power Blocks 472 MW - (2)	15.21	Natural Gas			Two natural-gas-fired combined cycle powerblocks where each powerblock consists of a combustion turbine and heat recovery steam generator with duct burner.	Nitrogen Oxides (NOx)	SCR	2.00	PPMDV	
GARRISON ENERGY CENTER	GARRISON ENERGY CENTER, LLC/ CALPINE CORPORATION	DE	Stuart Widom	1/30/2013	one (1) 309 MW GE Combined Cycle Combustion Turbine Generating system fired principally on Natural Gas, one (1) 86,000 GPM Cooling Tower, one (1) 1,400,000 ULSD Storage Tank		Unit 1	15.21	Natural Gas	2,260	million BTUs		Nitrogen Oxides (NOx)	Low NOx Combustors, Selective Catalytic Reduction	2.00	PPM	HOURLY AS BASELOAD ON NAT. GAS
DUKE ENERGY HANGING ROCK ENERGY	DUKE ENERGY HANGING ROCK, LLC	OH	Andrew Roebel	12/18/2012	Four Natural Gas Fired Combustion Turbines, with Duct Burners; Combined Cycle, each 172 MW	This is a modification of RBLC OH-0252 to remove operating hour restrictions on duct burners, with changes to hourly limits without increasing the annual emission limitations. Original PTI # was 07-00503	Turbines (4) (model GE 7FA) Duct Burners Off	15.21	NATURAL GAS	172	MW	Four GE 7FA combined cycle turbines, dry low NOx burners and selective catalytic reduction. These limits are for each of the 4 turbines individually, while operating with the duct burners off. This permit is a modification to RBLC OH-0252 to remove hourly restrictions on duct burners.	Nitrogen Oxides (NOx)	Dry Low NOx burners and Selective Catalytic Reduction	21	LB/ H	

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
DUKE ENERGY HANGING ROCK ENERGY	DUKE ENERGY HANGING ROCK, LLC	OH	Andrew Roebel	12/18/2012	Four Natural Gas Fired Combustion Turbines, with Duct Burners; Combined Cycle, each 172 MW	This is a modification of RBLC OH-0252 to remove operating hour restrictions on duct burners, with changes to hourly limits without increasing the annual emission limitations. Original PTI # was 07-00503	Turbines (4) (model GE 7FA) Duct Burners On	15.21	NATURAL GAS	172	MW	Four GE 7FA combined cycle turbines, dry low NOx burners and selective catalytic reduction. These limits are for each of the 4 turbines individually, while operating with the duct burners on. This permit is a modification to RBLC OH-0252 to remove hourly restrictions on duct burners.	Nitrogen Oxides (NOx)	Dry Low NOx burners and Selective Catalytic Reduction	28	LB/ H	
ST. JOSEPH ENERGY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	2,300	MMBTU/ H	EACH TURBINE IS EQUIPED WITH DRY LOW NOX BURNERS, NATURAL GAS FIRED DUCT BURNERS, AND A HEAT RECOVERY STEAM GENERATOR IDENTIFIED AS HRSG#. NOX EMISSIONS CONTROLLED BY SELECTIVE CATALYTIC REDUCTION SYSTEMS (SCR##) ALONG WITH CO AND VOC EMISSSIONS CONTROLLED BY OXIDATION CATAYLST SYSTEMS (CAT##) IN EACH TURBINE. EACH STACK HAS CONTINUOUS EMISSIONS MONITORS FOR NOX AND CO. COMBINED NOMIAL POWER OUTPUT IS 1.350 MW.	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION AND DRY LOW NOX BURNERS	2.00	PPMVD	3 HOURS
ST. JOSEPH ENERGY CENTER, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES - START UP/ SHUTDOWN CYCLE	15.21	NATURAL GAS	2,300	MMBTU/ H	A STARTUP/ SHUTDOWN CYCLE IS A PAIR OF SUBSEQUENT SHUTDOWN AND STARTUP EVENTS (I.E., ONE STARTUP FOLLOWED BY ONE SHUTDOWN REPRESENTS ONE STARTUP/ SHUTDOWN CYCLE).	Nitrogen Oxides (NOx)		443	LB	EVENT*
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/ hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined cycle turbine with duct burner	15.21	natural gas	39,463	mmcubic ft/ year*	* Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler	Nitrogen Oxides (NOx)	Selective catalytic reduction (SCR) system	2.00	PPMVD	3-HR ROLLING AVERAGE BASED ON 1-HR BLOCK
HESS NEWARK ENERGY CENTER	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/ hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined Cycle Combustion Turbine	15.21	natural gas	39,463	MMCubic ft/ yr	Fuel: Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler CO2e = 2,000,268 t/ yr for the facility (2 turbines, 2 duct burners and 1 auxiliary boiler, 1 emergency generator and 1 fire pump)	Nitrogen Oxides (NOx)	Selective Catalytic Reduction (SCR) System and use of natural gas a clean burning fuel	0.75	LB/ H	AVERAGE OF THREE TESTS
NRG ENERGY CENTER DOVER	NRG ENERGY CENTER DOVER LLC	DE	William Grow	10/31/2012	The facility operates two electric generation units and an auxiliary steam boiler.		UNIT 2- KD1	15.21	Natural Gas	655	MMBTU/ H	500 MMBTU/ hr Gas Turbine (Model: GE LM6000) rated at 52 MW and 155 MMBTU/ hr Heat Recovery Steam Generator rated at 18 MW. The unit is required to operate a certified CEMS and COMS.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	5.76	LB/ H	1 HR AVERAGE
CHANNEL ENERGY CENTER LLC	CHANNEL ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	10/15/2012	Combustion turbine (Siemens 501F)/ duct burners (475 MMBtu/ hr) with heat recovery steam generator	42179 and N021M1	Combined Cycle Turbine	15.21	natural gas	180	MW	The turbine is a Siemens 501F rated at a nominal 180 MW and the duct burner will have a maximum design heat input of 475 MMBtu/ hr.	Nitrogen Oxides (NOx)	Selective catalytic reduction	2.00	PPMVD	@15% O2 ON A 3-HR ROLLING AVG
POLK POWER STATION	TAMPA ELECTRIC COMPANY	FL	Paul Carpinone	10/14/2012	The Polk Power Station consists of: a nominal 250 MW (net) solid fuel-based integrated gasification and combined cycle (Unit 1) including a sulfuric acid plant and an auxiliary boiler; four natural gas-fueled nominal 165 MW simple cycle combustion turbine-electrical generators (CTGs) designated as Units 2, 3, 4 and 5; and ancillary equipment. Units 2 and 3 are equipped with backup fuel oil-firing capability.	GHG(e) emissions: 4,307,862	Combine cycle power block (4 on 1)	15.21	natural gas	1,160	MW	Basis for the emission standard is either NSPS Subpart KKKK or Department BACT determinations. The BACT emission standards for NOX while operating in combined cycle are more stringent than the corresponding Subpart KKKK emissions standards of 15 and 42 ppmvd @15% O2 on a 30-day rolling average for natural gas and fuel oil, respectively.	Nitrogen Oxides (NOx)	SCR/ DLN	2.00	PPMVD @15% O2	24-HR BLOCK (GAS) CEMS

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
MOXIE LIBERTY LLC/ ASYLUM POWER PL T	MOXIE ENERGY LLC	PA	Kent J Morton	10/10/2012		The project consists of two identical 1 x 1 power blocks, and each block includes a combustion gas turbine and a steam turbine. Each combined-cycle process will also include a heat recovery steam generator and supplemental duct burners. Additionally, one diesel-fired emergency generator, one diesel-fired fire water pump, two diesel fuel storage tanks, two lube oil storage tanks, and one aqueous ammonia storage tank were proposed to be constructed and operated. Each combined-cycle process will be rated at 468 MW or less.	Combined-cycle Turbines (2) - Natural gas fired	15.21	Natural Gas	3,277	MMBTU/ H	Two combine cycle Turbines, each with a combustion turbine and heat recovery steam generator with duct burner. Each combined-cycle process will be rated at 468 MW or less. The heat input rating of each combustion gas turbine is 2890 MMBtu/ hr (HHV) or less, and the heat input rating of each supplemental duct burner is equal to 387 MMBtu/ hr (HHV) or less.	Nitrogen Oxides (NOx)	Dry low-NOx (DLN) combustor and selective catalytic reduction (SCR)	2.00	PPMVD	
DEER PARK ENERGY CENTER	DEER PARK ENERGY CENTER LLC	TX	Ms. Jan Stavinoha	9/26/2012	The Deer Park Energy Center is a combined cycle cogeneration facility consisting of five Siemens/ Westinghouse 501F combustion turbine generators, each with a 725 MMBtu/ hr duct burner and heat recovery steam generator.	45642 and N036M2	Combined Cycle Turbine	15.21	natural gas	180	MW	natural gas-fired combined cycle turbine generator with a heat recovery steam generator equipped with a duct burner. The turbine is a Siemens 501F rated at a nominal 180 megawatts and the DB will have a maximum design rate capability of 725 million British thermal units per hour	Nitrogen Oxides (NOx)	Selective Catalytic Reduction	2.00	PPMVD	@15% O2, 3-HR ROLLING AVG
ES JOSLIN POWER PLANT	CALHOUN PORT AUTHORITY	TX	Charles Hausmann	9/12/2012	Three gas-fired combined cycle turbine generators, including a steam turbine generator, to replace the existing steam boiler/ turbine generator.	96336	Combined cycle gas turbine	15.21	natural gas	195	MW	The three combustion turbine generators (CTG) will be the General Electric 7FA, each with a maximum base-load electric power output of approximately 195 megawatts (MW). The steam turbine is rated at approximately 235 MW. This project also includes the installation of two emergency generators, one fire water pump, and auxiliary equipment. No duct burners.	Nitrogen Oxides (NOx)	Selective catalytic reduction	2.00	PPMVD	@15% O2, 24-HR ROLLING AVG
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Combined Cycle Turbine (EP01)	15.21	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	3.00	PPMV AT 15% O2	1-HOUR
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Combined Cycle Turbine (EP02)	15.21	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	3.00	PPMV AT 15% O2	1-HOUR
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/ hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural gas	40,298	mmcubic ft/ year	Woodbridge Energy Center (WEC), located at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, will be a new 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) each with a maximum rated heat input of 2,307 million British thermal units per hour (MMBtu/ hr), that will utilize pipeline natural gas only, with 2 HRSGs, 2 Duct Burners (each 500 MMBtu/ hr).	Nitrogen Oxides (NOx)	Low NOx burners and Selective Catalytic Reduction System	20	LB/ H	AVERAGE OF THREE 1- HOUR TESTS
WOODBRIDGE ENERGY CENTER	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/ hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine w/ o duct burner	15.21	natural gas	40,298	mmcubic ft/ year	The above natural gas use is combined for two GE 7FA CC turbines (each with a maximum heat input of 2, 307 MMBtu/ hr)and two duct burners (each with a maximum heat input of 500 MMBtu/ hr)	Nitrogen Oxides (NOx)	DLN combustion system with SCR on each of the two combustion turbines and use of only natural gas as fuel.	2.00	PPMVD	3-HR ROLLING AVE BASED ON 1-HR BLOCK
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Combined Cycle Refrigeration Compressor Turbines (8)	15.21	natural gas	286	MMBTU/ H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	23	LB/ H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Combined Cycle Refrigeration Compressor Turbines (8)	15.21	natural gas	286	MMBTU/ H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	23	LB/ H	HOURLY MAXIMUM
SUMPTER POWER PLANT	WOLVERINE POWER SUPPLY COOPERATIVE INC.	MI	Brian Warner	11/17/2011	Utility--Natural gas fired combustion turbine	Other Facility Wide Pollutants not listed below: PM10 = 14.8 tpy PM2.5 = 14.8 tpy CO2e = 232,639 tpy	Combined cycle combustion turbine w/ HRSG	15.21	Natural gas	130	MW electrical output	This is a combined-cycle combustion turbine with a non-fired heat recovery steam generator (HRSG). Natural gas-fired combustion turbine conversion to combined-cycle.	Nitrogen Oxides (NOx)	Low NOx burners	9.00	PPM	24-HR ROLLING AVERAGE

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/ 18/ 2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/ 17/ 2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/ 28/ 2013.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Nitrogen Oxides (NOx)	DRY LOW NOX (DLN) COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR)	2.00	PPMVD	@15% O2, 1-HR AVG
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/ 18/ 2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/ 17/ 2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/ 28/ 2013.	COMBUSTION TURBINES (STARTUP PERIODS)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Nitrogen Oxides (NOx)	DRY LOW NOX (DLN) COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR)	96	LB/ EVENT	COLD STARTUP PERIODS
PALMDALE HYBRID POWER PROJECT	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/ 18/ 2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/ 17/ 2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/ 28/ 2013.	COMBUSTION TURBINES (SHUTDOWN PERIODS)	15.21	NATURAL GAS	110	MMBTU/ H	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Nitrogen Oxides (NOx)	DRY LOW NOX (DLN) COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR)	57	LB/ EVENT	SHUTDOWN PERIODS
THOMAS C. FERGUSON POWER PLANT	LOWER COLORADO RIVER AUTHORITY	TX	Joe Bentley	9/1/2011	Power Plant. Two natural gas-fired combined cycle turbine generators (GE 7FA) with unfired HRSG	93938	Natural gas-fired turbines	15.21	natural gas	390	MW	(2) GE7FA at 195 MW each, (1) steam turbine at 200 MW. Each turbine is equipped with an unfired heat recovery steam generator (HRSG), which provides steam for the steam turbine.	Nitrogen Oxides (NOx)	Dry low NOx burners and Selective Catalytic Reduction	2.00	PPMVD	ROLLING 24-HR AT 15% OXYGEN
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	2.00	PPMVD	@15% O2, 1-HR AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	2.00	PPMVD	@15% O2, 1-HR AVG

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #1 (STARTUP SHUTDOWN PERIODS)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	160	LB/ H	EACH TURBINE & HRSG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	2.00	PPMVD	@15% O2, 1-HR AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	2.00	PPMVD	@15% O2, 1-HR AVG
AVENAL ENERGY PROJECT	AVENAL POWER CENTER LLC	CA	Jim Rexroad	6/21/2011	600 MW (NET) COMBINED CYCLE NATURAL GAS-FIRED POWER PLANT	PSD permit issued on May 27, 2011, and administratively amended on June 21, 2011. (Note: PSD permit appealed to the EAB. EAB denied petitions for review on 8/ 18/ 2011. Enviros sued EPA in the Ninth Circuit Court of Appeals for the issuance of the permit. This lawsuit is still in litigation. Facility has not yet been constructed. PSD permit expired on 2/ 18/ 2013. The applicant requested an extension of the PSD permit on 2/ 5/ 2013. EPA Region 9 is processing the permit extension request.)	COMBUSTION TURBINE #2 (STARTUP SHUTDOWN PERIODS)	15.21	NATURAL GAS	180	MW		Nitrogen Oxides (NOx)	SCR, DRY LOW NOX COMBUSTORS	160	LB/ H	EACH TURBINE & HRSG
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/ 29/ 2008, amended on 3/ 19/ 2010 to revise startup and shutdown emission limits, and amended again on 3/ 11/ 2011 to incorporate technical corrections.	COMBUSTION TURBINES (WARM STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/ HR DUCT BURNER AND HRSG.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	250	LB/ H	WARM STARTUP PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/ 29/ 2008, amended on 3/ 19/ 2010 to revise startup and shutdown emission limits, and amended again on 3/ 11/ 2011 to incorporate technical corrections.	COMBUSTION TURBINES (HOT STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/ HR DUCT BURNER AND HRSG.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	152	LB/ H	HOT STARTUP PERIODS
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/ 29/ 2008, amended on 3/ 19/ 2010 to revise startup and shutdown emission limits, and amended again on 3/ 11/ 2011 to incorporate technical corrections.	COMBUSTION TURBINES (SHUTDOWN PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/ HR DUCT BURNER AND HRSG.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	115	LB/ H	TURBINE SHUTDOWN PERIODS

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/ 29/ 2008, amended on 3/ 19/ 2010 to revise startup and shutdown emission limits, and amended again on 3/ 11/ 2011 to incorporate technical corrections.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/ HR DUCT BURNER AND HRSG.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	2.00	PPMVD	@15% O2, 1-HR ROLLING AVG
COLUSA GENERATING STATION	PACIFIC GAS & ELECTRIC COMPANY	CA	Steve Royall	3/11/2011	660 MW NATURAL GAS FIRED POWER PLANT	PSD Permit issued on 9/ 29/ 2008, amended on 3/ 19/ 2010 to revise startup and shutdown emission limits, and amended again on 3/ 11/ 2011 to incorporate technical corrections.	COMBUSTION TURBINES (COLD STARTUP PERIODS)	15.21	NATURAL GAS	172	MW	TWO (2) NATURAL GAS FIRED TURBINES AT 172 MW EACH. BOTH TURBINES EQUIPPED WITH A 688 MMBTU/ HR DUCT BURNER AND HRSG.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	333	LB/ H	COLD STARTUP PERIODS
CARTY PLANT	PORTLAND GENERAL ELECTRIC	OR		12/29/2010	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENERATING UNIT PSD PERMIT	PSD PERMIT	COMBINED CYCLE NATURAL GAS-FIRED ELECTRIC GENERATING UNIT	15.21	NATURAL GAS	2,866	MMBTU/ H		Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION (SCR)	2.00	PPM@15% O2	3-HOUR ROLLING
NELSON ENERGY CENTER	INVENERGY NELSON, LLC	IL	Joel Schroeder	12/28/2010	Natural gas-fired electric power generation facility with two combined cycle turbines followed by heat recovery steam generators (HRSG) and the capability for supplemental fuel firing in the HRSG for each turbine using duct burners. NOx emissions will be controlled by SCR and low NOx combustors.	LSP-Nelson Energy started construction pursuant to a permit issued in year 2000 for a facility that was not completed due to financial difficulties, which eventually resulted in LSP-Nelson entering bankruptcy. Substantial construction of foundations and infrastructure for all units and physical installation of one turbine were completed, including construction of HRSGs.	Electric Generation Facility	15.21	Natural Gas	220	MW each	Two combined cycle combustion turbines followed by HRSGs with capability for supplemental fuel firing in HRSG for each combustion turbine using duct burners.	Nitrogen Oxides (NOx)	SCR and Low-NOx Combustors	4.50	PPMVD @ 15% O2	HOURLY AVG EXCEPT DURING SSM OR TUNING
INTERNATIONAL STATION POWER PLANT	CHUGACH ELECTRIC ASSOCIATION	AK	Gregory Arthur	12/20/2010	Power plant that contains four combustion turbines, four duct burners, a black start generator, and an auxiliary heater.		Fuel Combustion	15.21	Natural Gas	59,900	HP	EU IDs 5-8 Combined Cycle Natural Gas-fired Combustion Turbines rated at 59,900 hp (44.7 MW)	Nitrogen Oxides (NOx)	Turbines EU IDs 5 through 8 shall be equipped with Selective Catalytic Reduction and Dry Low NOx (SCR and DLN) combustors. SCR is a post-combustion gas treatment technique for reduction of nitric oxide (NO) and nitrogen dioxide (NO2) in the turbine exhaust stream to molecular nitrogen, water, and oxygen. This process is accomplished by using ammonia (NH3) as a reducing agent, and is injected into the flue gas upstream of the catalyst bed. By lowering the activation energy of the NOx decomposition removal efficiency of 80 to 90 percent are achievable. DLN combustors utilize multistage premix combustors where the air and fuel is mixed at a lean fuel to air ratio. The excess air in the lean mixture acts as a heat sink, which lowers peak combustion temperatures and also ensures a more homogeneous mixture, both resulting in greatly reduced NOx formation rates. DLN can reduce emissions by about 60%	5.00	PPM	4-HOUR
INTERNATIONAL STATION POWER PLANT	CHUGACH ELECTRIC ASSOCIATION	AK	Gregory Arthur	12/20/2010	Power plant that contains four combustion turbines, four duct burners, a black start generator, and an auxiliary heater.		Fuel Combustion	12.31	Natural Gas	140	MMBTU/ H	EU IDs 9-12 Duct Burners	Nitrogen Oxides (NOx)	Duct Burners EU IDs 9 through 12 shall be equipped with Selective Catalytic Reduction (SCR). SCR is a post-combustion gas treatment technique for reduction of nitric oxide (NO) and nitrogen dioxide (NO2) in the turbine exhaust stream to molecular nitrogen, water, and oxygen. This process is accomplished by using ammonia (NH3) as a reducing agent, and is injected into the flue gas upstream of the catalyst bed. By lowering the activation energy of the NOx decomposition removal efficiency of 80 to 90 percent are achievable.	5.00	PPM	4-HR AVG.

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WARREN COUNTY POWER PLANT - DOMINION	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Robert Bisha	12/17/2010	Virginia Electric and Power Company (Dominion) has proposed to construct and operate a combined-cycle electric power generating facility in Warren County with a nominal generating capacity of 1280 megawatts (MW) at ISO (International Organization for Standardization) conditions.	Equipment to be constructed at this facility consists of: 3 Mitsubishi Model M501 GAC natural gas-fired combined-cycle turbines, each rated at 299,600 kW (2,996 MMBtu/ hr. Each equipped with a heat recovery steam generator (HRSG) having a duct burner with a design rating of 500 MMBtu/ hr. This permit supersedes the previous permit issued on 7/ 30/ 2004 to CPV Warren LLC.	COMBINED CYCLE TURBINE DUCT BURNER, 3	15.21	Natural Gas	2,996	MMBTU/ H	Emissions are for one of three units (Mitsubishi natural gas-fired combustion turbine (CT) generator,Model M501 GAC).	Nitrogen Oxides (NOx)	Two-stage, lean pre-mix dry low-NOx combustor and a selective catalytic reduction (SCR) control system using ammonia injection.	2.00	PPMVD @ 15%O2	ONE HOUR AVERAGE
KING POWER STATION	PONDERA CAPITAL MANAGEMENT GP INC	TX	Mark Chrisos	8/5/2010	Four combined-cycle natural gas-fired combustion turbines	State permit number 84289 Nonattainment permit number N75	Turbine	15.21	natural gas	1,350	MW	The plant will be designed to generate 1,350 nominal megawatts of power. There are two configuration scenarios: either four Siemens SGT6-5000F CTGs in combined-cycle mode (Scenario A) or four GE Frame 7FA CTGs in combined cycle mode (Scenario B). Scenario B also includes one or two auxiliary boilers.	Nitrogen Oxides (NOx)	DLN burners and SCR	2.00	PPMVD AT 15% O2	1-HOUR AVERAGE
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Four combined cycle combution turbines	15.21	natural gas	373	MMBTU/ H	Three GE, LMS6000 PF, natural gas-fired, combined cycle CTG, rated at 373 MMBtu per hour each, based on HHV and one (1) HRSG each with no Duct Burners	Nitrogen Oxides (NOx)	Dry Low NOx (DLN) Combustor and Selective Catalytic Reduction (SCR)	3.00	PPMVD AT 15% O2	1-HR AVE
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Four combined cycle combustion turbines	15.21	natural gas	373	MMBTU/ H	Three GE, LMS6000 PF, natural gas-fired, combined cycle CTG, rated at 373 MMBtu per hour each, based on HHV and one (1) HRSG each with no Duct Burners	Nitrogen Oxides (NOx)	Dry Low NOx (DLN) Combustor and Selective Catalytic Reduction (SCR)	3.00	PPMVD AT 15% O2	1-HR AVE
LANGLEY GULCH POWER PLANT	IDAHO POWER COMPANY	ID		6/25/2010	ONE-ON-ONE COMBINED CYCLE PLANT CONSISTING OF (1) NATURAL GAS-FIRED COMBUSTION TURBINE (CT) AND (1) STEAM TURBINE. THE CT IS EQUIPPED WITH (1) HEAT RECOVERY STEAM GENERATOR (HRSG) AND DUCT BURNER. ANCILLARY EQUIPMENT INCLUDES (1) DIESEL-FIRED EMERGENCY GENERATOR, (1) DIESEL-FIRED FIRE PUMP, (1) WET COOLING TOWER, AND (6) DRY CHEMICAL STORAGE SILOS.		COMBUSTION TURBINE, COMBINED CYCLE W/ DUCT BURNER	15.21	NATURAL GAS (ONLY)	2,375	MMBTU/ H	SIEMENS SGT6-5000F COMBUSTION TURBINE (NGCT, CCGT) FOR ELECTRICAL GENERATION, NOMINAL 269 MW AND 2.1466 MMSCF/ HR	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION (SCR), DRY LOW NOX (DLN), GOOD COMBUSTION PRACTICES (GCP)	2.00	PPMVD	3-HR ROLLING / 15% O2
LIVE OAKS POWER PLANT	LIVE OAKS COMPANY, LLC	GA	Burt Wallace	4/8/2010	LIVE OAKS POWER PLANT PROPOSED FACILITY WILL OPERATE AS A FULLY DISPATCHABLE ELECTRIC GENERATING FACILITY. THE COMBINED CYCLE SYSTEM WILL UTILIZE TWO COMBUSTION TURBINES AND ONE STEAM TURBINE, CONFIGURED IN A TWO-ON-ONE ARRANGEMENT. THE HEAT CONTENT OF THE EXHAUST GASSES WIL BE RECOVERED BY A HEAT RECOVERY STEAM GENERATOR (HRSG), AND USED TO DRIVE A STEAM TURBINE. DURING PEAK LOADS A DUCT BURNER IN THE HRSG CAN BE FIRED TO AD ADDITIONAL HEAT ENERGY TO THE GAS TURBINE EXHAUST, INCREASING THE PRODUCTION OF STEAM SENT TO THE STEAM TURBINE. THE COMBUSTION TURBINES (CTs) SELECTED ARE SIEMENS MODEL SGT6-5000F. EACH COMBUSTION TURBINE WILL GENERATE 200 MW OF ELECTRIC POWER. THE GROSS ELECTRICAL CAPACITY OF THE COMBINED CYCLE FACILITY FIRING NATURAL GAS WILL THEN BE 600 MW.	PM10 74.3(+) EMISSIONS (T/ YR)	COMBINED CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT	15.21	NATURAL GAS	600	MW		Nitrogen Oxides (NOx)	DRY LOW NOx BURNERS, SELECTIVE CATALYTIC REDUCTION	2.50	PPM@15% 02	3 HOUR AVERAGE/ CONDITION 2.11
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (COLD STARTUP PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	52	LB/ H	COLD STARTUP PERIODS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (WARM HOT STARTUP PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	30	LB/ H	WARM & HOT STARTUP PERIODS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (SHUTDOWN PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	114	LB/ H	SHUTDOWN PERIODS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, NO DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Dioxide (NO2)	SCR	2.00	PPMVD	@15% O2, 1-HR AVG (NO DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (COLD STARTUP PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	52	LB/ H	COLD STARTUP PERIODS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (WARM HOT STARTUP PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	30	LB/ H	WARM & HOW STARTUP PERIODS
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (SHUTDOWN PERIODS)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Oxides (NOx)	SCR	114	LB/ H	SHUTDOWN PERIODS

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #2 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Dioxide (NO2)	SCR	2.00	PPMVD	@15% O2, 1-HR AVG (W/ DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, NO DUCT BURNING)	15.21	Natural Gas	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Dioxide (NO2)	SCR	2.00	PPMVD	1-HR AVG, @15% O2 (NO DUCT BURNING)
VICTORVILLE 2 HYBRID POWER PROJECT	CITY OF VICTORVILLE	CA	John B. Roberts	3/11/2010	563 MW power plant comprised of a hybrid of natural gas-fired combined cycle generating equipment integrated with solar thermal components		COMBUSTION TURBINE #1 (NORMAL OPERATION, WITH DUCT BURNING)	15.21	NATURAL GAS	154	MW	154 MW Combined Cycle Combustion Turbine Generator	Nitrogen Dioxide (NO2)	SCR	2.00	PPMVD	@15% O2, 1-HR AVG (W/ DUCT BURNING)
HIGH DESERT POWER PROJECT	HIGH DESERT POWER PROJECT LLC	CA	Jon Boyer	3/11/2010	720 MW NATURAL GAS FIRED POWER PLANT	RBLC Management: There were many duplicate pollutant records Editor repeated all emission limits for each of the 3 types of operation, Start-up, Normal, and Shutdown. Record was edited and duplicate records were deleted. Original Note: PSD Permit amended to change the design of the power plant. These changes include a modification in the turbine configuration from 3x3x3 (i.e., three combustion turbines (CT), three heat recovery steam generators (HRSG), and three steam turbine generators (STG)) to a 3x3x1 configuration, reconfiguration of the cooling tower from three towers to one, addition of a diesel firewater pump engine, modification of the stack location, elevation, and diameter, and modification in the physical dimensions of the cooling tower, steam turbine, and HRSG structure. The terms and conditions included in the PSD permit issued February 15, 2001, and the modeling analyses on which the original determinations were based, remain valid and in effect.	COMBUSTION TURBINE GENERATORS (NORMAL OPERATION)	15.21	NATURAL GAS	190	MW	THREE (3) COMBUSTION TURBINE GENERATORS AT 190 MW EACH AND EQUIPPED WITH A 160 MMBTU/HR DUCT BURNER AND HRSG	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	2.5	PPMVD	@15% O2, 1-HR AVG
HIGH DESERT POWER PROJECT	HIGH DESERT POWER PROJECT LLC	CA	Jon Boyer	3/11/2010	720 MW NATURAL GAS FIRED POWER PLANT	RBLC Management: There were many duplicate pollutant records Editor repeated all emission limits for each of the 3 types of operation, Start-up, Normal, and Shutdown. Record was edited and duplicate records were deleted. Original Note: PSD Permit amended to change the design of the power plant. These changes include a modification in the turbine configuration from 3x3x3 (i.e., three combustion turbines (CT), three heat recovery steam generators (HRSG), and three steam turbine generators (STG)) to a 3x3x1 configuration, reconfiguration of the cooling tower from three towers to one, addition of a diesel firewater pump engine, modification of the stack location, elevation, and diameter, and modification in the physical dimensions of the cooling tower, steam turbine, and HRSG structure. The terms and conditions included in the PSD permit issued February 15, 2001, and the modeling analyses on which the original determinations were based, remain valid and in effect.	COMBUSTION TURBINE GENERATOR (STARTUP PERIODS)	15.21	NATURAL GAS	190	MW	THREE (3) COMBUSTION TURBINE GENERATORS AT 190 MW EACH AND EQUIPPED WITH A 160 MMBTU/HR DUCT BURNER AND HRSG	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	3,541	LB/COLD STARTUP	COLD STARTUP PERIODS

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
HIGH DESERT POWER PROJECT	HIGH DESERT POWER PROJECT LLC	CA	Jon Boyer	3/11/2010	720 MW NATURAL GAS FIRED POWER PLANT	RBLC Management: There were many duplicate pollutant records Editor repeated all emission limits for each of the 3 types of operation, Start-up, Normal, and Shutdown. Record was edited and duplicate records were deleted. Original Note: PSD Permit amended to change the design of the power plant. These changes include a modification in the turbine configuration from 3x3x3 (i.e., three combustion turbines (CT), three heat recovery steam generators (HRSG), and three steam turbine generators (STG)) to a 3x3x1 configuration, reconfiguration of the cooling tower from three towers to one, addition of a diesel firewater pump engine, modification of the stack location, elevation, and diameter, and modification in the physical dimensions of the cooling tower, steam turbine, and HRSG structure. The terms and conditions included in the PSD permit issued February 15, 2001, and the modeling analyses on which the original determinations were based, remain valid and in effect.	COMBUSTION TURBINE GENERATOR (SHUTDOWN PERIODS)	15.21	NATURAL GAS	190	MW	THREE (3) COMBUSTION TURBINE GENERATORS AT 190 MW EACH AND EQUIPPED WITH A 160 MMBTU/HR DUCT BURNER AND HRSG	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (LNB), SELECTIVE CATALYTIC REDUCTION (SCR)	97	LB/SHUTDOWN	SHUTDOWN PERIODS
MADISON BELL ENERGY CENTER	MADISON BELL PARTNERS LP	TX		8/18/2009	THE PROJECT WOULD INCLUDE FOUR NATURAL GAS-FIRED COMBUSTION TURBINES (GE F7EA) AND FOUR HEAT RECOVERY STEAM GENERATORS (HRSGS) WITH PROVISIONS FOR DUCT FIRING. THE PROPOSED PROJECT WILL OPERATE THE COMBUSTION TURBINES IN COMBINED CYCLE MODE. THE COMBINED NOMINAL GENERATING CAPACITY OF THE PLANT IS APPROXIMATELY 550 MW IN COMBINED CYCLE MODE.	PSDTX1105	ELECTRICITY GENERATION	15.21	NATURAL GAS	275	MW	FOUR GE PG7121(EA) COMBINE CYCLE TURBINES FIRING NATURAL GAS WILL DIRECTLY GENERATE 75 MW; EACH HAS A 165 MMBTU/HR DUCT BURNER AND A HEAT RECOVERY STEAM GENERATOR. TWO HRSGS WILL TURN ONE 125 MW STEAM TURBINE AND THE OTHER TWO WILL TURN ANOTHER 125 MW STEAM TURBINE. THE TURBINE MAY OPERATE WITHOUT THE DUCT BURNER.	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION	2.00	PPMVD	@ 15% O2, 24-HR ROLLING AVG
NATURAL GAS-FIRED POWER GENERATION FACILITY	LAMAR POWER PARTNERS II LLC	TX		6/22/2009	THE NEW POWER BLOCK WILL BE CAPABLE OF PRODUCING EITHER 620 OR 910 MEGAWATTS OF ELECTRICITY, DEPENDING UPON WHICH COMBUSTION TURBINE MODEL OPTION IS CHOSEN.	PSDTX1106	ELECTRICITY GENERATION	15.21	NATURAL GAS	250	MW	LAMAR POWER PARTNERS PROPOSES TO CONSTRUCT A NATURAL GAS-FIRED COMBINED-CYCLE POWER BLOCK TO BE BUILT AT THE EXISTING SITE IN LAMAR COUNTY, TEXAS. THE NEW POWER BLOCK WILL BE CAPABLE OF PRODUCING EITHER 620 OR 910 MEGAWATTS OF ELECTRICITY, DEPENDING UPON WHICH COMBUSTION TURBINE MODEL OPTION IS CHOSEN. THE PROPOSED PROJECT WOULD INCLUDE TWO COMBUSTION TURBINES (EITHER 170 MW GENERAL ELECTRIC 7FAS OR 250 MW MITSUBISHI 501GS), TWO HEAT RECOVERY STEAM GENERATORS WITH DUCT BURNERS AND ONE STEAM TURBINE. THE GE7FAS WOULD BE CAPABLE OF PRODUCING 620 MW OF ELECTRICITY IN COMBINED CYCLE MODE, WHILE THE M501GS WOULD PRODUCE 910 MW IN COMBINED CYCLE MODE.	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION	2.00	PPMVD	@ 15% O2, 24-HR ROLLING AVG
PATTILLO BRANCH POWER PLANT	PATTILLO BRANCH POWER COMPANY LLC	TX		6/17/2009	1400 MW POWER PLANT. 4 NATURAL GAS FIRED TURBINES PLUS HEAT RECOVERY STEAM GENERATORS (HRSG)	PSDTX1115	ELECTRICITY GENERATION	15.21	NATURAL GAS	350	MW	EACH TURBINE/HRSG WILL BE DESIGNED TO OUTPUT 350 MW. TURBINES BEING CONSIDERED FOR THE PROJECT ARE GE 7FA, GE 7FB, AND SIEMENS SGT6-5000F.	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION	2.00	PPMVD	@ 15% O2 24-HR ROLLING AVG
WEST DEPTFORD ENERGY	LS POWER	NJ	Douglus Mulvey	5/6/2009	A NEW POWER GENERATING FACILITY TO BE BUILT IN WEST DEPTFORD. IT IS A PSD, LAER AND TITLE V FACILITY.	NEW 600 MW COMBINED CYCLE POWER GENERATING FACILITY	TURBINE, COMBINED CYCLE	15.21	NATURAL GAS	17,298	MMFT3/YR		Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION (SCR) AND WATER INJECTION	0.01	LB/MMBTU	3 HR ROLLING AVERAGE

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
BOSQUE COUNTY POWER PLANT	BOSQUE POWER COMPANY LLC	TX	Ms Kathy French	2/27/2009	BOSQUE POWER COMPANY IS SEEKING TO AMEND THEIR EXISTING PERMIT TO CONSTRUCT DUCT FIRING CAPABILITY TO THE HEAT RECOVERY STEAM GENERATORS (HRSGS) AUTHORIZED FOR THE UNIT 1 AND UNIT 2 GAS TURBINES. EACH COMBUSTION TURBINE IS NOMINALLY RATED AT 170 MEGAWATTS (MW) WHEN OPERATED IN THE SIMPLE CYCLE MODE (UP TO 8,760 HOURS A YEAR). UNITS 1 AND 2 ARE ALSO PERMITTED TO OPERATE IN COMBINED CYCLE MODE. WITH THE AMENDED PERMIT, EACH OF THE HRSGS WILL BE EQUIPPED WITH A 212 MMBTU/HR NATURAL GAS-FIRED DUCT BURNER UNIT TO BE OPERATED AS POWER DEMAND REQUIRES. ADDITIONAL EQUIPMENT ALREADY AUTHORIZED UNDER THE CURRENT PERMIT INCLUDES: TWO MULTI-CELL MECHANICAL COOLING TOWERS, A SMALL 16.8 MMBTU/HR NATURAL GAS FIRED HEATER AND NATURAL GAS PIPING. BOSQUE IS ALSO SEEKING AUTHORIZATION FOR THE ADDITION OF AN AMMONIA STORAGE AND HANDLING SYSTEM WITH THIS PERMIT AMENDMENT/RENEWAL APPLICATION.	PSDTX931M1	ELECTRICAL GENERATION	15.21	NATURAL GAS	170	MW	BOSQUE POWER COMPANY IS SEEKING TO AMEND THEIR EXISTING PERMIT TO CONSTRUCT DUCT FIRING CAPABILITY TO THE HEAT RECOVERY STEAM GENERATORS (HRSGS) AUTHORIZED FOR THE UNIT 1 AND UNIT 2 GAS TURBINES. EACH COMBUSTION TURBINE IS NOMINALLY RATED AT 170 MEGAWATTS (MW) WHEN OPERATED IN THE SIMPLE CYCLE MODE (UP TO 8,760 HOURS A YEAR). UNITS 1 AND 2 ARE ALSO PERMITTED TO OPERATE IN COMBINED CYCLE MODE. WITH THE AMENDED PERMIT, EACH OF THE HRSGS WILL BE EQUIPPED WITH A 212 MMBTU/HR NATURAL GAS-FIRED DUCT BURNER UNIT TO BE OPERATED AS POWER DEMAND REQUIRES. ADDITIONAL EQUIPMENT ALREADY AUTHORIZED UNDER THE CURRENT PERMIT INCLUDES: TWO MULTI-CELL MECHANICAL COOLING TOWERS, A SMALL 16.8 MMBTU/HR NATURAL GAS FIRED HEATER AND NATURAL GAS PIPING. BOSQUE IS ALSO SEEKING AUTHORIZATION FOR THE ADDITION OF AN AMMONIA STORAGE AND HANDLING SYSTEM WITH THIS PERMIT AMENDMENT/RENEWAL APPLICATION.	Nitrogen Oxides (NOx)	BACT IS 9 PPMVD AT 15% O2 THROUGH THE USE OF DRY LOW-NOX (DLN) COMBUSTERS WHEN THE COMBUSTION TURBINE IS OPERATING IN THE SIMPLE CYCLE MODE.	2	PPMVD	24-HOUR 15% O2
CHOUTEAU POWER PLANT	ASSOCIATED ELECTRIC COOPERATIVE INC	OK		1/23/2009			COMBINED CYCLE COGENERATION 25MW	15.21	NATURAL GAS	1,882	MMBTU/H	SIEMENS V84.3A	Nitrogen Oxides (NOx)	SCR AND DRY LOW-NOX	2.00	PPM	1-H AVG @ 15% O2
CHOUTEAU POWER PLANT	ASSOCIATED ELECTRIC COOPERATIVE INC	OK		1/23/2009			COMBINED CYCLE COGENERATION 25MW	15.21	NATURAL GAS	1,882	MMBTU/H	SIEMENS V84.3A	Nitrogen Oxides (NOx)	DRY LOW-NOX	568	LB/EVENT	4-H STARTUP
CPV ST CHARLES	COMPETITIVE POWER VENTURES, INC./CPV MARYLAND, LLC	MD	Sharon K Segner	11/12/2008	640 MW GENERATING FACILITY		COMBUSTION TURBINES (2)	15.21	NATURAL GAS			GENERAL ELECTRIC 207FA COMBUSTION TURBINE WITH HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT FIRING CAPABILIY (DUCT BURNER EQUIPPED WITH LNB). EACH CT IS CAPABLE OF GENERATING A NOMINAL 176 MW OF ELECTRICITY. THE STEAM TURBINE IS CAPABLE OF GENERATING 304 MW OF ELECTRICITY. OVERALL FACILITY NOMINAL GENERATION CAPACITY OF 640 MW	Nitrogen Oxides (NOx)	DRY LOW NOX BURNER AND SCR	2	PPMVD @ 15% O2	3-HR ROLLING AVERAGE
CANE ISLAND POWER PARK	FLORIDA MUNICIPAL POWER AGENCY (FMPA	FL	Roger Fontes	9/8/2008	FMPA AND THE KISSIMMEE UTILITIES AUTHORITY (KUA) JOINTLY OWN THE CIPP, WHICH IS LOCATED IN OSCEOLA COUNTY AT 6075 OLD TAMPA HIGHWAY, INTERCESSION CITY, FLORIDA. THE CIPP PRESENTLY CONSISTS OF ONE 40 MEGAWATT (MW) SIMPLE CYCLE COMBUSTION TURBINE (UNIT 1), A 120 MW COMBINED CYCLE UNIT INCLUDING A HEAT RECOVERY STEAM GENERATOR (HRSG) (UNIT 2) AND A 250 MW COMBINED CYCLE UNIT (UNIT 3). THE THREE EXISTING UNITS FIRE NATURAL GAS AS THE PRIMARY FUEL, WITH DISTILLATE FUEL AS BACKUP. THE NEW UNIT WILL BE A NATURAL GAS 300 MW COMBINED CYCLE UNIT AND ASSOCIATED EQUIPMENT.	THE PROJECT WILL BE A ONE-ON-ONE 300 MW NATURAL GAS-FUELED COMBINED CYCLE UNIT (CIPP UNIT 4) AND ASSOCIATED AUXILIARY EQUIPMENT. UNIT 4 AND ASSOCIATED AUXILIARY EQUIPMENT WILL CONSIST OF: A NOMINAL 150 MW GAS-FUELED GENERAL ELECTRIC 7241 FA CTG; A SUPPLEMENTARY-FIRED HRSG WITH NATURAL GAS FUELED DUCT BURNERS (DB); A NOMINAL 150 MW STG; A NOMINAL 160-FOOT STACK; AN EMERGENCY DIESEL ENGINE FIRE PUMP AND SMALL ULTRALOW SULFUR DIESEL (ULSD) FUEL OIL (FO)STORAGE TANK; A NOMINAL 750 KILOWATTS (KW) SAFE SHUTDOWN DIESEL GENERATOR WITH A ULSD FO STORAGE TANK; AND A MECHANICAL DRAFT COOLING TOWER WITH DRIFT ELIMINATORS.	300 MW COMBINED CYCLE COMBUSTION TURBINE	15.21	NATURAL GAS	1,860	MMBTU/H		Nitrogen Oxides (NOx)	SCR	2	PPMVD	24-HR

Table C-3. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - NO_x Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
FPL WEST COUNTY ENERGY CENTER UNIT 3	FLORIDA POWER AND LIGHT COMPANY (FP&L)	FL	Randall R. Labauve	7/30/2008	THE FPL WEST COUNTY ENERGY CENTER (WCEC) WAS PREVIOUSLY APPROVED FOR CONSTRUCTION AS A NOMINAL 2,500 MEGAWATT (MW) GREENFIELD POWER PLANT. THE PREVIOUSLY APPROVED CONSTRUCTION UNDERWAY (PHASE I) IS FOR TWO NOMINAL 1,250 MW GAS-FIRED COMBINED CYCLE UNITS (UNITS 1 AND 2) THAT WILL USE ULTRALOW SULFUR DIESEL (ULSD) FUEL OIL (FO) AS BACKUP FUEL. PHASE 2: UNITS 1 AND 2 WILL EACH CONSIST OF: THREE NOMINAL 250 MEGAWATT (MW) MODEL 501G COMBUSTION TURBINE-ELECTRICAL GENERATORS (CTG) WITH EVAPORATIVE INLET COOLING SYSTEMS; THREE SUPPLEMENTARY-FIRED HEAT RECOVERY STEAM GENERATORS (HRSG) WITH SELECTIVE CATALYTIC REDUCTION (SCR) REACTORS; ONE NOMINAL 428 MMBTU/HOUR (LOWER HEATING VALUE - LHV) GAS-FIRED DUCT BURNER (DB) LOCATED WITHIN EACH OF THE THREE HRSG; THREE 149 FEET EXHAUST STACKS; ONE 26 CELL MECHANICAL DRAFT COOLING TOWER; AND A COMMON NOMINAL 500 MW STEAM-ELECTRICAL GENERATOR (STG). PREVIOUSLY APPROVED ANCILLARY EQUIPMENT INCLUDES: FOUR EMERGENCY GENERATORS; TWO NATURAL GAS FIRED FUEL HEATERS; ONE EMERGENCY DIESEL FIRED PUMP; TWO DIESEL FUEL STORAGE TANKS; TWO AUXILIARY STEAM BOILERS; AND OTHER ASSOCIATED SUPPORT EQUIPMENT. THIS PERMIT AUTHORIZES CONSTRUCTION OF ANOTHER 1,250 MW GAS-FIRED COMBINED CYCLE UNIT (UNIT 3) IDENTICAL TO THE DESCRIPTION GIVEN ABOVE FOR UNITS 1 AND 2. ADDITIONAL ANCILLARY EQUIPMENT FOR UNIT 3 WILL INCLUDE TWO EMERGENCY GENERATORS, TWO NATURAL GAS FIRED FUEL HEATERS AND ASSOCIATED EQUIPMENT. UNIT 3 WILL USE SOME OF THE INFRASTRUCTURE AND ANCILLARY EQUIPMENT ALREADY UNDER CONSTRUCTION INCLUDING THE DIESEL STORAGE TANKS AND AUXILIARY BOILERS.	COMBINED CYCLE UNIT 3 WILL CONSIST OF: THREE NOMINAL 250 MEGAWATT (MW) G CLASS COMBUSTION TURBINE-ELECTRICAL GENERATORS (CTG) EVAPORATIVE INLET COOLING SYSTEMS; THREE SUPPLEMENTARY-FIRED HEAT RECOVERY STEAM GENERATORS (HRSG) WITH SELECTIVE CATALYTIC REDUCTION (SCR) REACTORS AND A NOMINAL 428 MMBTU/HOUR (LOWER HEATING VALUE LHV) GAS-FIRED DB; THREE 149 FOOT EXHAUST STACKS; ONE 26-CELL MECHANICAL DRAFT COOLING TOWER; AND A COMMON NOMINAL 500 MW STEAM-ELECTRICAL GENERATOR.	THREE NOMINAL 250 MW CTG (EACH) WITH SUPPLEMENTARY - FIRED HRSG	15.21	NATURAL GAS	2,333	MMBTU/H	FUEL HEAT INPUT RATE (LHV): OIL 2,117 MMBTU/H COMBINED CYCLE UNIT 3 WILL CONSIST OF: THREE NOMINAL 250 MW COMBUSTION TURBINE-ELECTRICAL GENERATORS (CTG) WITH EVAPORATIVE INLET COOLING SYSTEMS; THREE SUPPLEMENTARY-FIRED HEAT RECOVERY STEAM GENERATORS (HRSG) WITH SELECTIVE CATALYTIC REDUCTION (SCR) REACTORS AND A COMMON NOMINAL 500 MW STEAM-ELECTRICAL GENERATOR.	Nitrogen Oxides (NOx)	DRY LOW NOX SELECTIVE CATALYST REDUCTION	2	PPMVD (GAS)	24 HOURS
PLAQUEMINE COGENERATION FACILITY	THE DOW CHEMICAL COMPANY	LA	Kris Gaus	7/23/2008	STEAM AND POWER GENERATION FACILITY COMPRISED OF FOUR NATURAL GAS FIRED GE FRAME 7 FA GAS TURBINES, EACH WITH A NOMINAL POWER RATING OF 170 MW, EACH EQUIPPED WITH DRY LOW NOX COMBUSTORS AND STEAM INJECTION CAPABILITIES, HEAT RECOVERY STEAM GENERATOR (HRSG), SUPPLEMENTARY FIRED DUCT BURNER SYSTEM, SELECTIVE CATALYTIC REDUCTION (SCR) SYSTEM.	LOCATED WITHIN THE DOW CHEMICAL COMPANY'S LOUISIANA OPERATIONS COMPLEX. PSD-LA-659(M-1), ISSUED 10/3/03, REVISED LB/HR & TPY LIMITS ASSOCIATED WITH THE COOLING TOWER. THE UPDATED RATES ARE REFLECTED HEREIN. PSD-LA-659(M-1), ISSUED JULY 23, 2008 REVISE THE MAXIMUM NOX EMISSIONS TO 240 LBS/HR AND INCLUDE MAXIMUM NOX EMISSIONS DURING STARTUPS AND SHUTDOWNS AS 480 LBS/HR	(4) GAS TURBINES/ DUCT BURNERS	15.21	NATURAL GAS	2,876	MMBTU/H	VISUAL INSPECTION FOR OPACITY ON A WEEKLY BASIS, STACK TESTS FOR PM, NOX, SO2, OPACITY, CO EMISSION POINTS GT-500, -600, -700, -800.	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS, SELECTIVE CATALYTIC REDUCTION	240	LB/H	HOURLY MAXIMUM - NORMAL OPERATION
ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	Kris Gaus	3/20/2008	NATURAL GAS FIRED ELECTRICAL GENERATION PLANT.		TWO COMBINED CYCLE GAS TURBINES	15.21	NATURAL GAS	2,110	MMBTU/H	CTG-1 TURBINE/DUCT BURNER (EQT012) CTG-2 TURBINE/DUCT BURNER(EQT013)	Nitrogen Oxides (NOx)	LOW NOX TURBINES, DUCT BURNERS COMBINED WITH SCR	30.15	LB/H	MAX
ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	Kris Gaus	3/20/2008	NATURAL GAS FIRED ELECTRICAL GENERATION PLANT.		SCN-4 HOT STARTUP CTG-1 SCN-8 HOT STARTUP CTG-2	15.21	NATURAL GAS	2,110	MMBTU/H		Nitrogen Oxides (NOx)	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURES RECOMMENDED PROCEDURES.	400	LB/H	MAX
KLEEN ENERGY SYSTEMS, LLC	KLEEN ENERGY SYSTEMS, LLC	CT	Jason Farren	2/25/2008	580 MW NOMINAL (620 MW PEAK) BASE LOAD NATURAL GAS FIRED POWER PLANT WITH NO.2 OIL BACKUP. TWO SIEMENS SGT6-5000F COMBUSTION TURBINE TRAINS WITH HRSG AND NATURAL GAS DUCT BURNER.	FACILITY CONSISTS OF TWO TURBINE TRAINS. EACH TURBINE TRAIN CONSISTS OF A SIEMENS SGT6-5000F COMBUSTION TURBINE WITH NATURAL GAS AS PRIMARY AND OIL AS BACKUP, A 445 MMBTU/HR NATURAL GAS ONLY DUCT BURNER AND AN HRSG. CONTROL EQUIPMENT ON EACH TRAIN CONSISTS OF AN SCR AND CO CATALYST. EMISSION RATES PRESENTED WITHIN ARE FOR EACH TURINE TRAIN INDIVIDUALLY. SHORT -TERM EMISSION RATES ARE REPRESENTATIVE OF STEADY STATE OPERATION. TRANSIENT OPERATION (START-UP, SHUT DOWN, ETC) SHORT-TERM EMISSION RATES ARE INCLUDED IN THE PERMITS FACILITY-WIDE EMISSIONS ARE REPRESENTATIVE OF EMISSIONS FROM EACH TURBINE TRAIN ONLY AND INCLUDE EMISSIONS FROM TRANSIENT OPERATIONS.	SIEMENS SGT6-5000F COMBUSTION TURBINE #1 AND #2 (NATURAL GAS FIRED) WITH 445 MMBTU/HR NATURAL GAS DUCT BURNER	15.21	NATURAL GAS	2	MMCF/H	THROUGHPUT IS FOR TURBINE ONLY WHEN FIRING NATURAL GAS TURBINE: 2136 MMBTU/HR (2.095 MMCF/HR) DUCT BURNER: 445 MMBTU/HR (0.436 MMCF/HR) EMISSION RATES ARE FOR EACH COMBUSTION TURBINE FIRING NATURAL GAS, NOT COMBINED.	Nitrogen Oxides (NOx)	LOW NOX BURNER AND SELECTIVE CATALYTIC REDUCTION	16	LB/H	W/OUT DUCT BURNER

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 CO - Simple-Cycle Combustion Turbine 1 (Commissioning) [SCN0005]	15.11	Natural Gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	240	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 CO - Simple-Cycle Combustion Turbine 2 (Commissioning) [SCN0006]	15.11	natural gas	2,201	MM BTU/hr	Commissioning is a one-time event which occurs after construction and is not anticipated to exceed 180 days.	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	240	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 SUSD - Simple-Cycle Combustion Turbine 1 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0019]	15.11	Natural Gas	2,201	MM BTU/hR	Limited to 600 hr/yr	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	86.38	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 SUSD - Simple-Cycle Combustion Turbine 2 (Startup/ Shutdown/ Maintenance/ Tuning/ Runback) [EQT0020]	15.11	Natural Gas	2,201	MM BTU/hr	limited to 600 hr/yr	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	86.38	LB/HR	HOURLY MAXIMUM
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 NO - Simple-Cycle Combustion Turbine 1 (Normal Operations) [EQT0017]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hrs/yr	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	9	PPMVD @15%O2	30-DAY ROLLING AVERAGE
WASHINGTON PARISH ENERGY CENTER	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	Seth Berend	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 NO - Simple-Cycle Combustion Turbine 2 (Normal Operations) [EQT0018]	15.11	Natural Gas	2,201	MM BTU/hr	Normal operations are based on 7000 hours per year	Nitrogen Oxides (NOx)	Pipeline quality natural gas & dry-low-NOX burners	9.00	PPMVD @15%O2	30-DAY ROLLING AVERAGE
WAVERLY POWER PLANT	PLEASANTS ENERGY LLC	WV	Gerald Gatti	3/13/2018	300 MW Sinple-Cycle Peaking Plant	Modification to existing PSD Permit (R14-0034, RBLC Number WV-0027) to add advanced gas path technology to the turbines that was defined as a change in the method of operation that resulted a major modification to the turbines.	GE 7FA.004 Turbine	15.11	Natural Gas	168	MW	This one entry is for both turbines as they are the same. Each turbine, after this modification, is a nominal 167.8 MW GE Model 7FA.004. Has oil-fire backup.	Nitrogen Oxides (NOx)	Dry LNB	69	LB/HR	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines	15.11	natural gas	920	MW	4 identical units, each limited to 2500 hours of operation per year	Nitrogen Oxides (NOx)	Dry low NOx burners	9.00	PPMVD	
JACKSON COUNTY GENERATORS	SOUTHERN POWER	TX	Susan Comensky	1/26/2018	four natural gas-fired simple-cycle combustion turbines, five fuel gas heaters, and a firewater pump engine		Combustion Turbines MSS	15.11	NATURAL GAS	0			Nitrogen Oxides (NOx)	Minimizing duration of startup/shutdown, using good air pollution control practices and safe operating practices.	0.01	TON/YR	
MUSTANG STATION	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jeff Pippin	8/16/2017	GE7FA combustion turbine (Unit 6) to increase the hours of operation to 3000 hours per year. The turbine construction was completed the first quarter of 2013 and initial firing began on April 1, 2013.		Simple Cycle Turbine	15.11	NATURAL GAS	163	MW	Unit 6 Turbine is limited to 3000 hours per year.	Nitrogen Oxides (NOx)	Dry low-NOx burners	9	PPMVD	
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	DAVID LOW	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	228	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Nitrogen Oxides (NOx)	Dry Low NOx burners (control), natural gas, good combustion practices, limited operating hours (prevention)	9	PPMV	15% O2 3-H AVG

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
GAINES COUNTY POWER PLANT	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	228	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Nitrogen Oxides (NOx)	Dry Low NOx burners (control), natural gas, good combustion practices, limited operating hours (prevention)	9	PPMV	15% O2 3-H AVG
VERMILLION GENERATING STATION	DUKE ENERGY INDIANA, LLC VERMILLION GENERATING STA	IN	Patrick Coughlin	2/28/2017	ELECTRIC UTILITY SERVICES		SIMPLE CYCLE, NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	80	MW		Nitrogen Oxides (NOx)	GOOD COMBUSTION PRACTICES	250	LB/H	EACH TURBINE
CAMERON LNG FACILITY	CAMERON LNG LLC	LA	Clayton Miller	2/17/2017	a facility to liquefy natural gas for export (5 trains)	Permit PSD-LA-766, dated 10/1/13 for liquefaction trains 1,2, and 3 Permit PSD-LA-766(M1), dated 6/26/14, for minor changes; Permit PSD-LA-766(M2), dated 3/3/16, for train 4 and 5	Gas turbines (9 units)	15.11	natural gas	1,069	mm btu/hr		Nitrogen Oxides (NOx)	good combustion practices and dry low nox burners	15	PPMVD	@15%O2
WAVERLY FACILITY	PLEASANTS ENERGY, LLC	WV	Gerald Gatti	1/23/2017	300 MW, natural gas fired, simple cycle peaking power facility	In this permitting action PSD only applies to the modified combustion turbines based on the relaxation of an original synthetic minor permit issued in 1999. Project also involves previous installation of turbo-charging. All BACT emission limits are given without turbocharging and startup/shutdown emissions are not included. Please contact above engineer for more information. There are two identical turbines but only one is listed.	GE Model 7FA Turbine	15.11	Natural Gas	1,571	mmbtu/hr	There are two identical units at the facility.	Nitrogen Oxides (NOx)	Dry Low-NOx Combustion System (DLNB), Water Injection	9	PPM	NATURAL GAS
MONTPELIER GENERATING STATION	AES OHIO GENERATION, LLC	IN	Drew Parker	1/6/2017	COMBUSTION TURBINES		PRATT TWIN-PAC SIMPLE CYCLE TURBINES	15.11	NATURAL GAS	271	MMBTU/H	NO. 2 DIESEL OIL BACKUP FUEL	Nitrogen Oxides (NOx)	WATER INJECTION	25	PPMV	AT 15% O2 FOR NATURAL GAS
PUENTE POWER		CA		10/13/2016	Utility		Gas turbine	15.11	Natural gas	262	MW		Nitrogen Oxides (NOx)		2.5	PPMVD	1 HOUR@15%O2
INVENERGY NELSON EXPANSION LLC	INVENERGY	IL	Gordon Gray	9/27/2016	Peaking facility at an existing major source. The expansion will consist of two simple cycle combustion turbines and a fuel heater.		Two Simple Cycle Combustion Turbines	15.11	Natural Gas	190	MW	Two simple cycle combustion turbines used for peaking purposes and fired primarily on natural gas with ULSD as a secondary fuel.	Nitrogen Oxides (NOx)	Dry low-NOx combustion technology for natural gas and low-NOx combustion technology and water injection for ULSD.	0.033	LB/ MMBTU	
GREENIDGE STATION	GREENIDGE GENERATION LLC	NY		9/7/2016	Greenidge Generation LLC has submitted a revised application for a Title V Air Permit in accordance with the requirements of Title 6 of the New York compilation of Codes, Rules, and Regulations, Part 201-6 (6 NYCRR Part 201-6). The application is for conversion of the Greenidge Electricity Generating Station, located in the Town of Torrey, Yates County to operate primarily on natural gas with up to 19% biomass co-firing. Greenidge Station is comprised of Unit 4, which includes a Combustion Engineering, tangentially-fired dry bottom boiler (Boiler No. 6) with a maximum heat input rating of 1,117 MMBtu/hr, and a steam generating turbine with a maximum rated output of 107 Megawatts (MW) of electricity. The facility is equipped with a suite of air pollution control (both pre-combustion and post-combustion) systems to control pollutant nitrogen oxides, carbon monoxide, and particulate matter (PM, PM10 and PM2.5) emissions from facility operations. Greenhouse gases will be reduced substantially primarily by the use of cleaner fuels. Under the proposal, Unit 4 will not burn coal or fuel oil any longer.	Also NAICS 221117 - biomass with wood	Turbine - natural gas	15.11	natural gas	107	MW		Nitrogen Oxides (NOx)	Advanced low NOx burners, closed-coupled and staged over-fire air, Selective Non-Catalytic Reduction, and Selective Catalytic Reduction.	0.03	LB/MMBTU	12 MO

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
BAYONNNE ENERGY CENTER	BAYONNNE ENERGY CENTER LLC	NJ	Ellen Allman	8/26/2016	Facility consists of 8 existing Roll Royce Trent 60 WLE (64 MW) each. The facility is adding two more new Roll Royce Trent 60 WLE (66 MW) each	The facility has eight existing simple cycle combustion turbines Rolls Royce Trent turbine 64 MW each. This permit allows the construction and operation of two more Rolls Royce Trent (WLE) simple cycle combustion turbines 66 MW each. The turbines will be dual fired, with natural gas as primary fuel and ultra low sulfur distillate oil with less than or equal to 15% sulfur by weight. The turbines will have SCR and Oxidation catalyst for removal of NOx, CO and VOC.	Simple Cycle Stationary Turbines firing Natural gas	15.11	Natural Gas	2,143,980	MMBTU/YR	The Siemens/Rolls Royce Trent 60 wet low emissions (WLE) combustion turbine generators (CTGs) will each have a maximum heat input rate while combusting natural gas of 643 million British thermal units per hour (MMBtu/hr) (higher heating value [HHV]) at 100 percent (%) load, at International Organization for Standardization (ISO) conditions of 59 degrees Fahrenheit (°F) and 60% relative humidity, generating 66 MW. The maximum heat input rate on ULSD at ISO condition would be 533.50 MMBtu/hr (HHV). Each of the CTG will be equipped with Water Injection and Selective Catalytic Reduction System (SCR) to control Nitrogen Oxide (NOx) emissions and Oxidation Catalyst to control Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) emissions. The CTGs will have continuous emissions monitoring systems (CEMs) for NOx and CO.	Nitrogen Oxides (NOx)	Selective Catalytic Reduction, water injection, use of natural gas a low NOx emitting fuel	2.5	PPMVD@ 15%O2	3 H ROLLING AV BASED ON ONE H BLOCK AV
HILL COUNTY GENERATING FACILITY	BRAZOS ELECTRIC COOPERATIVE	TX	Mike Meyers	4/7/2016	Four simple cycle combustion turbine electric generators are proposed. Natural gas or ultra-low sulfur diesel fuel oil are the fuels. Turbine model options are: General Electric (GE) 7FA.03, GE 7FA.04, GE 7FA.05, and Siemes SGT6-5000(5)ee. Electric output is between 684 and 928 megawatts (MW).		Simple cycle turbine	15.11	natural gas	171	MW	Each combustion turbine is limited to 2,920 hours of annual operation, including startup and shutdown hours.	Nitrogen Oxides (NOx)	Emission controls consist of dry low-NOx combustors (DLN). DLN combustors use two stages of combustion, transitioning from initial startup with fuel and flame in the primary nozzles only, through a lean lean stage with fuel and flame in the primary and secondary nozzles, to fuel in the secondary stage only, extinguishing the primary flame, and in full operation, premix mode, with fuel to both nozzles, but flame only in the second stage. When natural gas and air are well-mixed before combustion, the flame temperature and resulting NOx emissions are greatly reduced compared to conventional diffusion flame combustion.	9	PPMVD @ 15% O2	3-HR ROLLING AVERAGE
NECHES STATION	APEX TEXAS POWER LLC	TX	DAVID JENKINS	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines 25 MW	15.11	natural gas	232	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Nitrogen Oxides (NOx)	Dry low-NOx burners (DLN), good combustion practices	9	PPM	
NECHES STATION	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines 25 MW	15.11	natural gas	232	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Nitrogen Oxides (NOx)	Dry low-NOx burners (DLN), good combustion practices	9	PPM	
MAGNOLIA LNG FACILITY	MAGNOLIA LNG, LLC	LA	Komi Hassan	3/21/2016	A new facility to liquefy 8.0 million metric tons per year of natural gas		Gas Turbines (8 units)	15.11	natural gas	333	mm btu/hr		Nitrogen Oxides (NOx)	Dry Low NOX burners and good combustion practices	25	PPMVD	@15 %02
PORT ARTHUR LNG EXPORT TERMINAL	PORT ARTHUR LNG, LLC	TX	J.D. Morris	2/17/2016	Liquefied natural gas (LNG) export terminal		Simple Cycle Electrical Generation Gas Turbines 15.210	15.11	natural gas	34	MW	Nine GE PGT25+G4 gas turbines for electrical generation at the site at 34 MW/turbine	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION	5	PPM	ROLLING 24-HR AVERAGE

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
UNION VALLEY ENERGY CENTER	NAVASOTA SOUTH PEAKERS OPERATING COMPANY I, LLC.	TX	Bill Skinner	12/9/2015	three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 megawatt (MW) each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Nitrogen Oxides (NOx)	dry low NOX burners	9	PPMVD @ 15% O2	3-HR ROLLING AVERAGE PEAK
VAN ALSTYNE ENERGY CENTER (VAEC)	NAVASOTA NORTH COUNTRY PEAKERS OPERATING COMPANY I	TX	Bill Skinner	10/27/2015	Navasota North Country Peakers Operating Company I LLC. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 MW each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Nitrogen Oxides (NOx)	DLN burners	9	PPMVD @ 15% O2	3-HR AVERAGE
NACOGDOCHES POWER ELECTRIC GENERATING PLANT	NACOGDOCHES POWER, LLC	TX	Kelli Mccullough	10/14/2015	Nacogdoches Power, LLC is requesting authorization for one natural gas fired, simple cycle combustion turbine generator (CTG). The CTG will be a Siemens F5 and have a nominal electric output of 232 megawatts (MW).		Natural Gas Simple Cycle Turbine (25 MW)	15.11	natural gas	232	MW	One Siemens F5 simple cycle combustion turbine generator	Nitrogen Oxides (NOx)	Dry Low NOx burners, good combustion practices, limited operations	9	PPMVD @ 15% O2	
SHAWNEE ENERGY CENTER	SHAWNEE ENERGY CENTER, LLC	TX	Neil O'Donovan	10/9/2015	Electric Generating Utility: The project will consist of four gas fired combustion turbines (CTGs). The CTGs are fueled with pipeline quality natural gas and will operate in simple cycle mode. The gas turbines will be one of two options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	230	MW	Siemens Model SGT6-5000 F5ee " 230 MW or Second turbine option: General Electric Model 7FA.05TP " 227 MW	Nitrogen Oxides (NOx)	Dry Low NOx burners	9	PPMVD @ 15% O2	
FORT MYERS PLANT	FLORIDA POWER & LIGHT (FPL)	FL	John Hampp	9/10/2015	Electric power plant, consists of a 6-on-2 combined-cycle unit (Units 2A through 2F) and two modern simple-cycle combustion turbines. Primary fuel is natural gas. Also includes 12 gas turbines (63 MW each) for peaking, introduced into service in 1974. This project entails decommissioning 10 of the 12 peaking turbines. They will be replaced with two new GE 7F.05 turbines, each with nominal capacity of 200 MW	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0710002.022.AC.D.ZIP	Combustion Turbines	15.11	Natural gas	2,262	MMBtu/hr gas	Two GE 7F.05 turbines, approximately 200 MW each. Natural-gas is primary fuel. Permitted 3390 hr/yr of operation, of which no more than 500 hr may be on fuel oil. Dry Low-NOx, with wet injection for oil firing.	Nitrogen Oxides (NOx)	DLN and wet injection (for ULSD operation)	9	PPMVD@ 15% O2	GAS FIRING, 24-HR BLOCK AVG
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	8/25/2015	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	Re-affirmed BACT determinations in Permit No. 0110037-011-AC. Also, new GHG BACT determination. Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.013.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,100	MMBtu/hr (approx)	Five simple cycle GE 7F.05 turbines. Max of 3390 hours per year per turbine. Of the 3390 hours per year, up to 500 hour may be on ULSD fuel oil.	Nitrogen Oxides (NOx)	Dry-low-NOx combustion system. Wet injection when firing ULSD.	9	PPMVD@ 15%O2	24-HR BLOCK AVERAGE
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jolly Hayden	5/12/2015	Golden Spread Electric Cooperative, Inc. (GSEC) is requesting authorization for three additional simple cycle electric generating plants at an existing site to meet increased energy demand in the area. The generating equipment consists of three new GE 7F5-Series natural gas-fired combustion turbine generators (CTGs). Each turbine has a maximum electric output of 202 MW.		Simple Cycle Turbine Generator	15.11	natural gas	202	MW	3 additional GE 7F 5-Series Combustion Turbine Generators	Nitrogen Oxides (NOx)	Dry Low NOx burners	9	PPMVD AT 15% O2	
CLEAR SPRINGS ENERGY CENTER (CSEC)	NAVASOTA SOUTH PEAKERS OPERATING COMPANY II, LLC.	TX	Frank Giacalone	5/8/2015	Navasota South Peakers Operating Company II LLC. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 MW each; manufacturers output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	183	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Nitrogen Oxides (NOx)	dry low-NOx (DLN) burners	9	PPMVD @ 15% O2	3-HR AVERAGE
INDECK WHARTON ENERGY CENTER	INDECK WHARTON, L.L.C.	TX	James Schneider	2/2/2015	Indeck Wharton, L.L.C. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will either be the General Electric 7FA (~214 MW each) or the Siemens SGT6-5000F (~227 MW each), operating as peaking units in simple cycle mode.		(3) combustion turbines	15.11	natural gas	220	MW	The CTGs will either be the General Electric 7FA (~214 MW each) or the Siemens SGT6-5000F (~227 MW each), operating as peaking units in simple cycle mode	Nitrogen Oxides (NOx)	DLN combustors	9	PPMVD	@15% O2, 3-HR ROLLING AVERAGE
SR BERTRON ELECTRIC GENERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	12/19/2014	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the simple cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The new units will produce between 215-263 MW each.		Simple cycle natural gas turbines	15.11	Natural Gas	225	MW		Nitrogen Oxides (NOx)	DLN	9	PPM	3HR ROLLING AVG.
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	TIM MORDHORST	12/11/2014	Electric generation	Permit modification to convert startup and shutdown BACT limits to an hourly basis (from event based).	Turbines - two simple cycle gas	15.11	natural gas	800	MMBTU/H each	GE LMS100PA, natural gas fired, simple cycle, combustion turbine.	Nitrogen Oxides (NOx)	SCR and dry low NOx burners	23	LB/H	1-HR AVE / STARTUP AND SHUTDOWN

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	12/11/2014	Electric generation	Permit modification to convert startup and shutdown BACT limits to an hourly basis (from event based).	Turbines - two simple cycle gas	15.11	natural gas	800	MMBTU/H each	GE LMS100PA, natural gas fired, simple cycle, combustion turbine.	Nitrogen Oxides (NOx)	SCR and dry low NOx burners	23	LB/H	1-HR AVE / STARTUP AND SHUTDOWN
ROANS PRAIRIE GENERATING STATION	TENASKA ROANS PRAIRIE PARTNERS (TRPP), LLC	TX	Larry Carlson	9/22/2014	The proposed project is to construct and operate the RPGS comprised of three new simple cycle combustion turbine generators (CTG), fueled by pipeline quality natural gas. The new CTGs will be peaking units, designed to operate during periods of high electric demand. The three CTGs will produce between 507 and 694 MW of electricity combined, depending on ambient temperature and the model of combustion turbine (CT) selected. The applicant is considering three models of CTs; one model will be selected and the permit revised to reflect the selection before construction begins. The three CT models are: (1) General Electric 7FA.04; (2) General Electric 7FA.05; or (3) Siemens SGT6- 5000F.		(2) simple cycle turbines	15.11	natural gas	600	MW	The three possible CT models are: (1) General Electric 7FA.04; (2) General Electric 7FA.05; or (3) Siemens SGT6- 5000F. will operate 2,920 hours per year at full load for each CT	Nitrogen Oxides (NOx)	DLN combustors	9	PPMVD	@15% O2, 3-HR ROLLING AVG
ECTOR COUNTY ENERGY CENTER	INVENERGY THERMAL DEVELOPMENT LLC	TX	Jim Shield	8/1/2014	The proposed project is to construct and operate two natural gas-fired simple-cycle combustion turbine generators (CTGs) at the Ector County Energy Center (ECEC), located approximately 20 miles northwest of Odessa, Texas, in Ector County.		(2) combustion turbines	15.11	natural gas	180	MW	(2) GE 7FA.03, 2500 hours of operation per year each	Nitrogen Oxides (NOx)	DLN combustors	9	PPMVD	@15% O2, 3-HR ROLLING AVG
PERRYMAN GENERATING STATION	CONSTELLATION POWER SOURCE GENERATION, INC.	MD	Bill Leedy	7/1/2014	120 MEGAWATT SIMPLE CYCLE NATURAL GAS FIRED POWER PLANTPERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	PERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	(2) 60-MW SIMPLE CYCLE COMBUSTION TURBINES, FIRING NATURAL GAS	15.11	NATURAL GAS	120	MW	(2) 60-MEGAWATT PRATT & WHITNEY GAS TURBINE GENERATOR PACKAGE	Nitrogen Oxides (NOx)	USE OF NATURAL GAS, WATER/STEAM INJECTION, AND A SELECTIVE CATAYTIC REDUCTION (SCR) SYSTEM	2.5	PPMVD @ 15% O2	3-HOUR BLOCK AVERAGE, EXCLUDING SU/SD
MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	IN	Michael Chorlton	6/4/2014	A STATIONARY NITROGEN FERTILIZER MANUFACTURING FACILITY		TWO (2) NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	283	MMBTU/H, EACH	NATURAL GAS FIRED, OPEN-SIMPLE CYCLE COMBUSTION TURBINES WITH HEAT RECOVERY	Nitrogen Oxides (NOx)	DRY LOW NOX COMBUSTORS	22.65	PPMVD AT 15% OXYGEN	3-HR AVERAGE AT > 50% PEAK LOAD
MIDWEST FERTILIZER CORPORATION	MIDWEST FERTILIZER CORPORATION	IN	Michael Chorlton	6/4/2014	A STATIONARY NITROGEN FERTILIZER MANUFACTURING FACILITY		TWO (2) NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	283	MMBTU/H, EACH	NATURAL GAS FIRED, OPEN-SIMPLE CYCLE COMBUSTION TURBINES WITH HEAT RECOVERY	Nitrogen Oxides (NOx)	DRY LOW NOX COMBUSTORS	22.65	PPMVD AT 15% OXYGEN	3-HR AVERAGE AT > 50% PEAK LOAD
PH ROBINSON ELECTRIC GENERATING STATION	NRG TEXAS POWER LLC	TX	Craig Eckberg	5/20/2014	NRG proposes to construct six natural gas-fired simple cycle combustion turbine generators (CTG) for peaking, designed to operate during periods of high electric demand. The six CTGs selected by NRG are General Electric Frame 7E turbines have an ISO rating of 65 MW and a nominal maximum generating capacity of 80 MW. Each of the turbines will not exceed 20 percent annual capacity (equivalent to 1,752 full load hours) in any single year or 10 percent annual capacity factor (equivalent to 876 full load hours) averaged over any three year period.		(6) simple cycle turbines	15.11	natural gas	65	MW	General Electric Frame 7E turbines have an ISO rating of 65 MW and a nominal maximum generating capacity of 80 MW. The turbines were originally constructed as Frame 7B units that were remanufactured in 1999 and upgraded to 7E machines Each of the turbines will not exceed 20 percent annual capacity (equivalent to 1,752 full load hours) in any single year or 10 percent annual capacity factor (equivalent to 876 full load hours) averaged over any three year period, which qualifies each of the CTGs as Acid Rain Peaking Units under 40 CFR 72.2	Nitrogen Oxides (NOx)	DLN combustors	15	PPMVD	@15% O2, 3-HR ROLLING AVERAGE
LAUDERDALE PLANT	FLORIDA POWER & LIGHT	FL	John Hampp	4/22/2014	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	In this project, 24 peaking turbines from the Lauderdale facility are being replaced with five 200 MW combustion turbines at Lauderdale. The turbines will fire primarily natural gas, but may also fire ULSD fuel oil. Triggers PSD for NOx, PM, CO, VOC, and GHG. GHG permit issued by US EPA Region 4. Technical evaluation available at http://arm-permit2k.dep.state.fl.us/nontv/0110037.011.AC.D.ZIP	Five 200-MW combustion turbines	15.11	Natural gas	2,000	MMBtu/hr (approx)	Throughput could vary slightly (+/- 120 MMBtu/hr) depending on final selection of turbine model and firing of natural gas or oil. Primary fuel is expected to be gas. Each turbine limited to 3300 hrs per rolling 12-month period. Of these 3300 hrs, no more than 500 may use ULSD fuel oil.	Nitrogen Oxides (NOx)	Required to employ dry low-NOx technology and wet injection. Water injection must be used when firing ULSD.	9	PPMVD @ 15% 02	24-HR BLOCK AVG, BY CEMS (NAT GAS)
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	Jeff Pippin	4/22/2014	GSEC is proposing to build three additional new CTGs at the existing Antelope Elk Energy Center. The new facility will provide primarily peaking and intermediate power needs. The new units will be GE 7F5-Series gas turbines in simple cycle application, rated at 202 MW. Each turbine will operate a maximum of 4,572 hours per year.		Combustion Turbine-Generator (CTG)	15.11	Natural Gas	202	MW	Simple Cycle	Nitrogen Oxides (NOx)	DLN	9	PPM	15% O2, 3 HR. ROLLING AVG.

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
ANTELOPE ELK ENERGY CENTER	GOLDEN SPREAD ELECTRIC COOPERATIVE INC	TX	Jeff Pippin	4/22/2014	Golden Spread Electric Cooperative (GSEC) currently owns and operates Antelope Station (now renamed Antelope Elk Energy Center), a 168 MW generating facility made up of 18 quick start WÃ¤rtsilÃ¤ engines. GSEC is proposing to build a new combustion turbine-generator (CTG) facility at Antelope Station, while the 18 WÃ¤rtsilÃ¤ engines will remain and continue to be authorized by TCEQ Standard Permit. The new turbine-generator will provide primarily peaking and intermediate power needs in a highly cyclical operation. The CTG will produce approximately 100 - 200 MW of electricity, depending on loading and ambient temperature.		combustion turbine	15.11	natural gas	202	MW	new GE 7FA 5-Series gas turbine in a simple cycle application, with a maximum electric output of 202 megawatts (MW) and a maximum design capacity of 1,941 million British thermal units per hour (MMBtu/hr). The turbine will operate a maximum of 4,572 hours per year.	Nitrogen Oxides (NOx)	DLN combustors	9	PPMVD	@15% O2, 3-HR ROLLING AVERAGE
TROUTDALE ENERGY CENTER, LLC	TROUTDALE ENERGY CENTER, LLC	OR	WILLARD LADD	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		GE LMS-100 combustion turbines, simple cycle with water injection	15.11	natural gas	1,690	MMBTU/H		Nitrogen Oxides (NOx)	Utilize water injection when combusting natural gas or ULSD; Utilize selective catalytic reduction (SCR) with aqueous ammonia injection at all times except during startup and shutdown; Limit the time in startup or shutdown.	2.5	PPMDV AT 15% O2	3-HR ROLLING AVERAGE ON NG
TROUTDALE ENERGY CENTER, LLC	TROUTDALE ENERGY CENTER, LLC	OR	Willard Ladd	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		GE LMS-100 combustion turbines, simple cycle with water injection	15.11	natural gas	1,690	MMBTU/H		Nitrogen Oxides (NOx)	Utilize water injection when combusting natural gas or ULSD; Utilize selective catalytic reduction (SCR) with aqueous ammonia injection at all times except during startup and shutdown; Limit the time in startup or shutdown.	2.5	PPMDV AT 15% O2	3-HR ROLLING AVERAGE ON NG
LONESOME CREEK GENERATING STATION	BASIN ELECTRIC POWER COOP.	ND	Jerry Menge	9/16/2013	Three natural gas fired simple cycle turbines used to generate electricity for peak power demand. The turbines are GE LM6000 PF Sprint units with a nominal capacity of 45 MW each.		Natural Gas Fired Simple Cycle Turbines	15.11	Natural gas	412	MMBTU/H	The heat input is for a single unit.	Nitrogen Oxides (NOx)	SCR	5	PPMVD	4 HOUR ROLLING AVERAGE EXCEPT STARTUP
THETFORD GENERATING STATION	CONSUMERS ENERGY COMPANY	MI	JAMES WALKER	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FG-PEAKERS: 2 natural gas fired simple cycle combustion turbines	15.11	natural gas	171	MMBTU/H	Two natural gas fired simple cycle combustion turbines each with an electrical generator (nominal 13MW each; 171 MMBtu/hr heat input rating each). Each turbine is limited to 343 MMscf of natural gas per 12-month rolling time period as determined at the end of each calendar month. Both turbines combined are limited to 5.15 MMscf of natural gas each calendar day.	Nitrogen Oxides (NOx)	Dry low-NOx combustors	0.09	LB/MMBTU	TEST PROTOCOL WILL SPECIFY AVG. TIME.
PIONEER GENERATING STATION	BASIN ELECTRIC POWER COOPERATIVE	ND	Jerry Menge	5/14/2013	Three GE LM6000 PC SPRINT natural gas fired turbines used to generate electricity for peak periods.	The permit was for the addition of 2 turbines to the station. Since a synthetic minor limit was relaxed for the first unit, BACT was required for all three turbines.	Natural gas-fired turbines	15.11	Natural gas	451	MMBTU/H	Rating is for each turbine.	Nitrogen Oxides (NOx)	Water injection plus SCR	5	PPPMVD	4 HR. ROLLING AVERAGE EXCEPT FOR STARTUP
ECTOR COUNTY ENERGY CENTER	INVENERGY THERMAL DEVELOPMENT LLC	TX	Jim Shield	5/13/2013	The proposed project is for two natural gas fired simple cycle CTGs. The proposed models include GE7Fa.03 and GE7Fa.05. They have an output of 165-193 MW. The new CTGs will operate as peaking units and will be limited to 2500 hours per year of operation each.		Simple Cycle Combustion Turbines	15.11	natural gas	180	MW		Nitrogen Oxides (NOx)	Dry low NOx combustor	9	PPMVD	15%O2, 3HR ROLLING BASIS
WESTAR ENERGY - EMPORIA ENERGY CENTER	WESTAR ENERGY	KS	Stephanie Hirner	3/18/2013	The Westar Energy - Emporia Energy Center (Source ID: 1110046) is a fossil fuel power generation facility located in Emporia, Kansas.	This PSD permit with tracking number C-10656 is a modification of PSD permits C-9132 (issued on 5/5/2011) and C-7072 (issued 4/17/2007).	GE LM6000PC SPRINT Simple cycle combustion turbine	15.11	Pipeline quality natural gas	405	MMBTU/hr		Nitrogen Oxides (NOx)	water injection	25	PPMDV	24-HR ROLLING AVE; CORRECTED TO 15% O
WESTAR ENERGY - EMPORIA ENERGY CENTER	WESTAR ENERGY	KS	Stephanie Hirner	3/18/2013	The Westar Energy - Emporia Energy Center (Source ID: 1110046) is a fossil fuel power generation facility located in Emporia, Kansas.	This PSD permit with tracking number C-10656 is a modification of PSD permits C-9132 (issued on 5/5/2011) and C-7072 (issued 4/17/2007).	GE LM6000PC SPRINT Simple cycle combustion turbine	15.11	Pipeline quality natural gas	405	MMBTU/hr		Nitrogen Dioxide (NO2)	dry low NOx burners and fire only pipeline natural gas	9	PPMDV	24-HR ROLLING AVE, CORRECTED TO 15% O2
WESTAR ENERGY - EMPORIA ENERGY CENTER	WESTAR ENERGY	KS	Stephanie Hirner	3/18/2013	The Westar Energy - Emporia Energy Center (Source ID: 1110046) is a fossil fuel power generation facility located in Emporia, Kansas.	This PSD permit with tracking number C-10656 is a modification of PSD permits C-9132 (issued on 5/5/2011) and C-7072 (issued 4/17/2007).	GE 7FA Simple Cycle Combustion Turbine	15.11	Pipeline quality natural gas	1,780	MMBTU/HR		Nitrogen Oxides (NOx)	dry low NOx burners and fire only pipeline natural gas	9	PPMDV	24-HR ROLLING AVE, CORRECTED TO 15% O2
R.M. HESKETT STATION	MONTANA-DAKOTA UTILITIES CO.	ND	Abbie Krebsbach	2/22/2013	Addition of a natural gas-fired turbine (Unit 3) to an exisiting coal-fired power plant. The turbine will be used for supplying peak power and is rated at 986 MMBtu/hr and 88 MWe at average site conditions.		Combustion Turbine	15.11	Natural gas	986	MMBTU/H	Turbine is a GE Model PG 7121 (7EA) used as a peaking unit.	Nitrogen Oxides (NOx)	Dry low-NOx combustion (DLN)	9	PPMVD @15% OYYGEN	4 H.R.A. WHEN > 50MWE AND > 0 DEGREES F

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
PIO PICO ENERGY CENTER	PIO PICO ENERGY CENTER, LLC	CA	Gary Chandler	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (NORMAL OPERATION)	15.11	NATURAL GAS	300	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Nitrogen Oxides (NOx)	WATER INJECTION, SCR	2.5	PPMVD	@15% O2, 1-HR AVG
PIO PICO ENERGY CENTER	PIO PICO ENERGY CENTER, LLC	CA	Gary Chandler	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (STARTUP SHUTDOWN PERIODS)	15.11	NATURAL GAS	300	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Nitrogen Oxides (NOx)	water injection and SCR system	22.5	LB/H	STARTUP EVENTS
CEDAR BAYOU ELECTRIC GERNERATION STATION	NRG TEXAS POWER	TX	Craig Eckbert	9/12/2012	NRG is proposing to construct an additional electric power generation station at the existing site. The project will include two power blocks that can be operated in simple cycle or combined cycle modes. This entry is for the simple cycle operation. Each power block will contain a CTG with duct burners and HRSG. Three options were proposed: Siemens Model F5, GE7Fa, and Mitsubishi Heavy Industry G Frame. The units will produce between 215-263 MW each.		Simple Cycle Combustion Turbines	15.11	Natural Gas	225	MW	The gas turbines will be one of three options: (1) Two Siemens Model F5 (SF5) CTGs each rated at nominal capability of 225 megawatts (MW). (2) Two General Electric Model 7FA (GE7FA) CTGs each rated at nominal capability of 215 MW. (3) Two Mitsubishi Heavy Industry G Frame (MHI501G) CTGs each rated at a nominal electric output of 263 MW.	Nitrogen Oxides (NOx)	DLN	9	PPM	3HR. ROLLING AVG.
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	TIM ROGERS	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP03)	15.11	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	5	PPMV AT 15% O2	1-HOUR
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP03)	15.11	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	5	PPMV AT 15% O2	1-HOUR
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Trubine (EP04)	15.11	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	5	PPMV AT 15% O2	1-HOUR AVERAGE
CHEYENNE PRAIRIE GENERATING STATION	BLACK HILLS POWER, INC.	WY	Tim Rogers	8/28/2012	A nominal 220 megawatt (MW) gross electrical facility. The station is to consist of five (5) 40 MW GE LM6000 combustion turbine generators with two (2) of the turbines operating in combined cycle mode for an additional 20 MW in generation.		Simple Cycle Turbine (EP05)	15.11	Natural Gas	40	MW		Nitrogen Oxides (NOx)	SCR	5	PPMV AT 15% O2	1-HOUR
CALCASIEU PLANT	ENTERGY GULF STATES LA LLC	LA	Christee Herbert	12/21/2011	320 MW POWER PLANT COMPRISED OF 2 NATURAL GAS-FIRED SIMPLE CYCLE COMBUSTION TURBINES.	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS PSD TRIGGERED DUE TO RELAXATION OF A FEDERALLY-ENFORCEABLE CONDITION LIMITING POTENTIAL EMISSIONS BELOW MAJOR STATIONARY SOURCE THRESHOLDS.	TURBINE EXHAUST STACK NO. 1 NO. 2	15.11	NATURAL GAS	1,900	MM BTU/H EACH		Nitrogen Oxides (NOx)	DRY LOW NOX COMBUSTORS	240	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	PATRICIA OUTTRIM	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Generation Turbines (2)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	28.68	LB/H	HOURLY MAXIMUM

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	PATRICIA OUTTRIM	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Refrigeration Compressor Turbines (16)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	22.94	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Refrigeration Compressor Turbines (16)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	22.94	LB/H	HOURLY MAXIMUM
SABINE PASS LNG TERMINAL	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	Patricia Outtrim	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Generation Turbines (2)	15.11	Natural Gas	286	MMBTU/H	GE LM2500+G4	Nitrogen Oxides (NOx)	water injection	28.68	LB/H	HOURLY MAXIMUM
CUNNINGHAM POWER PLANT	SOUTHWESTERN PUBLIC SERVICE CO.	NM	Kevin Worley	5/2/2011	Electric steam generating facility providing commercial electric power using natural gas fired boilers and turbines.	Simple Cycle Combustion Turbines. Permit revises the NOx BACT ppmvd limit for turbines established in permit PSD-NM-622-M2 issued 2-10-97 because turbines have not been able to meet NOx BACT limits. No modification or change to mass emissions. Former NOx BACT was at 15 ppmvd w/out power augmentation (normal mode) and 25 ppmvd w/ power augmentation (see RBLC ID NM-0028). Entry also clarifies the existing CO, SOx, and PM BACT.	Normal Mode (without Power Augmentation)	15.11	natural gas				Nitrogen Dioxide (NO2)	Dry Low NOx Burners Type K & Good Combustion Practice	21	PPMVD	HOUR
CUNNINGHAM POWER PLANT	SOUTHWESTERN PUBLIC SERVICE CO.	NM	Kevin Worley	5/2/2011	Electric steam generating facility providing commercial electric power using natural gas fired boilers and turbines.	Simple Cycle Combustion Turbines. Permit revises the NOx BACT ppmvd limit for turbines established in permit PSD-NM-622-M2 issued 2-10-97 because turbines have not been able to meet NOx BACT limits. No modification or change to mass emissions. Former NOx BACT was at 15 ppmvd w/out power augmentation (normal mode) and 25 ppmvd w/ power augmentation (see RBLC ID NM-0028). Entry also clarifies the existing CO, SOx, and PM BACT.	Power Augmentation	15.11	natural gas			Increase power output by lowering the outlet air temperatur through water inejctinos into the compressor.	Nitrogen Dioxide (NO2)	Dry Low NOx burners, Type K. Good Combustion Practices as defined in the permit.	30	PPMVD	HOURLY
PSEG FOSSIL LLC KEARNY GENERATING STATION	PSEG FOSSIL LLC	NJ		10/27/2010	PSEG FOSSIL LLC KEARNY GENERATING STATION IS AN EXISTING ELECTRICITY GENERATING STATION.	This project consists of six new identical General Electric LM6000 sprint simple cycle combustion turbines burning natural gas. Each turbine will have a heat input rate of 485 million British thermal units per hour (MMBtu/hr) based on the high heating value of fuel (HHV). The combined maximum electricity generated by the six turbines will be 294 MW based on 2,978 hours of operation per turbine per year. All six new turbines will have water injection along with Selective Catalytic Reduction (SCR) systems to reduce Nitrogen Oxide (NOx) emissions and an oxidation catalyst to reduce Carbon Monoxide (CO) emissions	SIMPLE CYCLE TURBINE	15.11	Natural Gas	8,940,000	MMBtu/year (HHV)	Throughput <= 8.94xE6 MMBtu/year (HHV) combined for all six gas turbines. The 6 turbines are identical LM6000 simple cycle combustion turbines.	Nitrogen Oxides (NOx)	SCR and Use of Clean Burning Fuel: Natural gas	2.5	PPMVD@ 15%O2	3-HR ROLLING AVERAGE BASED ON 1-HR BLOCK

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
HOWARD DOWN STATION	VINELAND MUNICIPAL ELECTRIC UTILITY (VMEU)	NJ		9/16/2010			SIMPLE CYCLE (NO WASTE HEAT RECOVERY) (25 MW)	15.11	NATURAL GAS	5,000	MMFT3/YR	THE PROCESS CONSISTS OF ONE NEW TRENT 60 SIMPLE CYCLE COMBUSTION TURBINE. THE TURBINE WILL GENERATE 64 MW OF ELECTRICITY USING NATURAL GAS AS A PRIMARY FUEL (UP TO 8760 HOURS PER YEAR), WITH A BACKUP FUEL OF ULTRA LOW SULFUR DIESEL FUEL (ULSD) WHICH CAN ONLY BE COMBUSTED FOR A MAXIMUM OF 500 HOURS PER YEAR AND ONLY DURING NATURAL GAS CURTAILMENT. THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING NATURAL GAS IS 590 MMBTU/HR AND THE MAXIMUM HEAT INPUT RATE WHILE COMBUSTING ULSD IS 568 MMBTU/HR. THE TURBINE WILL UTILIZE WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION TO CONTROL NOX EMISSION AND A CATALYTIC OXIDIZER TO CONTROL CO AND VOC EMISSION.	Nitrogen Oxides (NOx)	THE TURBINE WILL UTILIZE WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR) TO CONTROL NOX EMISSION AND USE CLEAN FUELS NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL TO MINIMIZE NOX EMISSIONS	2.5	PPMVD@ 15%O2	3HR ROLLING AVERAGE BASED ON 1-HR BLOCK
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	TIM MORDHORST	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Three simple cycle combustion turbines	15.11	natural gas	800	MMBTU/H	Three GE, LMS100PA, natural gas-fired, simple cycle CTG rated at 799.7 MMBtu per hour each,based on HHV.	Nitrogen Oxides (NOx)	Good combustor design, Water Injection and Selective Catalytic Reduction (SCR)	5	PPMVD AT 15% O2	1-HR AVE
PUEBLO AIRPORT GENERATING STATION	BLACK HILLS ELECTRIC GENERATION, LLC	CO	Tim Mordhorst	7/22/2010	Combustion turbine power plant	New power plant consisting of 7 combustion turbines	Three simple cycle combustion turbines	15.11	natural gas	800	MMBTU/H	Three GE, LMS100PA, natural gas-fired, simple cycle CTG rated at 799.7 MMBtu per hour each,based on HHV.	Nitrogen Oxides (NOx)	Good combustor design, Water Injection and Selective Catalytic Reduction (SCR)	5	PPMVD AT 15% O2	1-HR AVE
DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P	SOUTHERN POWER COMPANY	GA	Mr. E.S. (Scott) Dial	5/14/2010	PLANT DAHLBERG HAS PROPOSED TO CONSTRUCT AND OPERATE FOUR ADDITIONAL SIMPLE-CYCLE COMBUSTION TURBINES (SOURCE CODES: CT11-CT14) AND ONE FUEL OIL STORAGE TANK. THE PROPOSED PROJECT WILL HAVE A NOMINAL GENERATING CAPACITY OF 760 MW. THE FACILITY IS CURRENTLY PERMITTED TO OPERATE 10 DUAL-FUELED SIMPLE-CYCLE CTG's. AFTER THE EXPANSION, THE FACILITY WILL HAVE A TOTAL NOMINAL GENERATING CAPACITY OF 1530 MW.		SIMPLE CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT	15.11	NATURAL GASE	1,530	MW	THE PROCESS USES FUEL OIL FOR BACKUP AT THE RATE OF 2129 MMBUT/H	Nitrogen Oxides (NOx)	DRY LOW NOX BURNERS (FIRING NATURAL GAS). WATER INJECTION (FIRING FUEL OIL).	9	PPM@15 %02	3 HOUR AVERAGE/ CONDITION 3.3.23
DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P	SOUTHERN POWER COMPANY	GA	Mr. E.S. (Scott) Dial	5/14/2010	PLANT DAHLBERG HAS PROPOSED TO CONSTRUCT AND OPERATE FOUR ADDITIONAL SIMPLE-CYCLE COMBUSTION TURBINES (SOURCE CODES: CT11-CT14) AND ONE FUEL OIL STORAGE TANK. THE PROPOSED PROJECT WILL HAVE A NOMINAL GENERATING CAPACITY OF 760 MW. THE FACILITY IS CURRENTLY PERMITTED TO OPERATE 10 DUAL-FUELED SIMPLE-CYCLE CTG's. AFTER THE EXPANSION, THE FACILITY WILL HAVE A TOTAL NOMINAL GENERATING CAPACITY OF 1530 MW.		SIMPLE CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT	15.11	NATURAL GASE	1,530	MW	THE PROCESS USES FUEL OIL FOR BACKUP AT THE RATE OF 2129 MMBUT/H	Nitrogen Oxides (NOx)	DRY LOW NOx BURNERS (FIRING NATURAL GAS), WATER INJECTION (FIRING FUEL OIL).	297	T/YR	12 CONSECUTIVE MONTH AVERAGE /CONDITION
EL CAJON ENERGY LLC	EL CAJON ENERGY LLC	CA	Genevieve Huffman	12/11/2009			Gas turbine simple cycle	15.11	Natural gas	50	MW		Nitrogen Oxides (NOx)	Water injection and SCR	2.5	PPMV	1 HOUR
DAYTON POWER & LIGHT ENERGY LLC	DAYTON POWER & LIGHT COMPANY	OH	Carrie Burks	12/3/2009	Seven simple cycle stationary combustion turbines all with rating of 80 MW and nominal heat input of 1115.2 mmBtu/hr using natural gas or No. 2 fuel oil and all with water injection control and last 5 also with low NOx burners.	Simple cycle stationary combution turbines issed in 2 different permits. Four turbines in this permit with dry low NOx combustion and water injection controls. Administrative Modification to original PTI #08-04153 issued 8/7/01, to incorporate low mass emissions methodology as allowed per 40 CFR 75.19 in lieu of methods under Appendix D or E to Part 75, by meeting the requirements of having mass emissions of less than 25 T/YR SO2 and less than 100 T/YR NOx (per turbine) based on 3 years of operation. Modification also reduced permitted formaldehyde emissions by 8.7 tons, recalculated based on the restriction on hours of operation.	Turbines (4), simple cycle, natural gas	15.11	NATURAL GAS	15,020	H/YR	Hours per year for all 4 turbines	Nitrogen Oxides (NOx)	dry low NOx burners	161	LB/H	EACH TURBINE

Table C-4. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - NO_X Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
BAYONNE ENERGY CENTER	BAYONNE ENERGY CENTER, LLC	NJ	Neil Collins	9/24/2009	TITLE V FACILITY - ID: 12863 A MAXIMUM 512 MW SIMPLE-CYCLE POWER GENERATING FACILITY LOCATED IN THE TOWNSHIP OF BAYONNE, NEW JERSEY, CONSISTING OF EIGHT IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES SUBJECT TO LAER FOR NOX, VOC	SUBJECT TO LAER FOR NOX, VOC	COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8	15.11	NATURAL GAS	603	MMBTU/H	EIGHT (8) IDENTICAL ROLLS ROYCE TRENT 60WLE (64 MW) SIMPLE CYCLE COMBUSTION TURBINES. EACH TURBINE HAS A RATED CAPACITY OF 603 MILLION BRITISH THERMAL UNIT PER HOUR HIGHER HEATING VALUE (MMBTU/HR HHV) WHEN BURNING NATURAL GAS AND A RATED CAPACITY OF 538 MMBTU/HR WHEN BURNING ULTRA LOW SULFUR DISTILLATE (ULSD) OIL WITH SULFUR CONTENT OF LESS THAN OR EQUAL TO 15 PPM BY WEIGHT. HOURS OF OPERATION FOR EACH COMBUSTION TURBINE WILL BE LIMITED TO 4,748 HOURS PER YEAR ON NATURAL GAS; OR 2,585 HOURS PER YEAR ON NATURAL GAS AND 720 HOURS PER YEAR ON ULSD WHEN OPERATING ON BOTH FUELS. POLLUTANT EMISSSION VAUES FOR ULSD OIL NOX: 5 PPMVD@ 15% O2 CO: 5 PPMVD@ 15% O2 VOC: 3.27 LB/HR PM10: 15 LB/HR SO2: 0.8 LB/HR	Nitrogen Oxides (NOx)	SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR) AND WET LOW-EMISSION (WLE) COMBUSTORS SUBJECT TO LAER	2.5	PPMVD@ 15%O2	
SHADY HILLS GENERATING STATION	SHADY HILLS POWER COMPANY	FL	Roy S. Belden	1/12/2009	THIS FACILITY CONSISTS OF THREE, DUAL-FUEL, NOMINAL 170 MW GENERAL ELECTRIC MODEL PG7241FA (GE 7FA) SIMPLE CYCLE COMBUSTION TURBINES-ELECTRICAL GENERATORS, THREE EXHAUST STACKS THAT ARE 18 FEET IN DIAMETER AND 75 FEET TALL, AND ONE 2.8-MILLION GALLON DISTILLATE FUEL OIL STORAGE TANK. THE COMBUSTION TURBINE UNITS CAN OPERATE IN SIMPLE-CYCLE MODE AND INTERMITTENT DUTY MODE. THE UNITS ARE EQUIPPED WITH DRY LOW-NITROGEN OXIDES (NOX) COMBUSTORS AND WATER INJECTION CAPABILITY. THE THREE COMBUSTION TURBINES ARE REGULATED UNDER PHASE II OF THE FEDERAL ACID RAIN PROGRAM. THIS FACILITY OPERATES DURING PEAK HOURS OF ELECTRICAL USE.		TWO SIMPLE CYCLE COMBUSTION TURBINE - MODEL 7FA	15.11	NATURAL GAS	170	MW	BACKUP FUEL: ULTRA LOW SULFUR DIESEL WITH A MAXIMUM SULFUR CONTENT OF 0.0015%, BY WEIGHT	Nitrogen Oxides (NOx)	FIRING NATURAL GAS AND USING DLN 2.6 COMBUSTORS TO MINIMIZE NOX EMISSSIONS.	9	PPMVD @ 15% O2	24-HR BLOCK AVG BY CEMS
ORANGE GROVE PROJECT		CA		12/4/2008			Gas turbine simple cycle	15.11	Natural gas	50	MW	Combustion turbine for peaking power plant	Nitrogen Oxides (NOx)	SCR water injection	2.5	PPM	1 HOUR
ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	KRIS GAUS	3/20/2008	NATURAL GAS FIRED ELECTRICAL GENERATION PLANT.		SCN-5 SHUTDOWN CTG-1 / SCN-9 SHUTDOWN CTG-2	15.11	NATURAL GAS	2,110	MMBTU/H		Nitrogen Oxides (NOx)	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURES RECOMMENDED PROCEDURES.	400	LB/H	MAX
ARSENAL HILL POWER PLANT	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)	LA	KRIS GAUS	3/20/2008	NATURAL GAS FIRED ELECTRICAL GENERATION PLANT.		SCN-3 COLD STARTUP CTG-1 SCN-7 COLD STARTUP CTG-2	15.11	NATURAL GAS	2,110	MMBTU/H		Nitrogen Oxides (NOx)	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURES RECOMMENDED PROCEDURES.	400	LB/H	MAX

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
New Covert Generating Facility	NEW COVERT GENERATING COMPANY, LLC	MI	John Reese	7/30/2018	Power plant	The equipment consists of three advanced firing temperature Mitsubishi 501G combustion turbines, three heat recovery steam generators supplemented with gas-fired duct burners each with a max firing rate of 256 million British thermal units per hour (MMBtu/hr), three steam turbine generators. Auxiliary equipment includes three mechanical draft evaporative cooling towers, one natural gas auxiliary boiler, one diesel emergency generator, one diesel fire water pump, one aqueous parts cleaner, and one gas heater.	FG-TURB/DB1-3 (3 combined cycle combustion turbine and heat recovery steam generator trains)	15.21	Natural gas	1,230	MW	Three (3) combined-cycle combustion turbine (CT) / heat recovery steam generator (HRSG) trains. Each CT is a natural gas fired Mitsubishi model 501G, equipped with dry low NOx combustor and inlet air evaporative cooling. Each HRSG includes a natural gas fired duct burner with a 256 MMBtu/hr heat input capacity and a dry low NOx burner.	Carbon Dioxide Equivalent (CO2e)	Several energy efficiency measures and the use of natural gas.	1,425,081	T/YR	EACH CT/HRSG TRAIN; 12-MO. ROLL TIME PER
Belle River Combined Cycle Power Plant	DTE ELECTRIC COMPANY	MI	Matthew Paul	7/16/2018	Natural gas combined-cycle power plant	The new combined cycle plant is proposed to be located near DTE's existing Belle River and St. Clair coal fired power plants. The three plants will be considered a single stationary source. It will have a capacity of 1,150 megawatts.	FGCTGHRSG (EUCTGHRSG1 EUCTGHRSG2)	15.21	Natural gas			Two (2) combined-cycle natural gas-fired combustion turbine generators, each with a heat recovery steam generator (CTGHRSG). Plant nominal 1,150 MW electricity production. Turbines are each rated at 3,658 MMBTU/H and HRSG duct burners are each rated at 800 MMBTU/H. The HRSGs are not capable of operating independently from the CTGs.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures	2,042,773	T/YR	12-MO ROLLING TIME PERIOD; EACH UNIT
Mec North, LLC And Mec South LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (South Plant): A combined cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/H (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/H (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR and an oxidation catalyst.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	1,978,297	T/YR	12-MO ROLLING TIME PERIOD
Mec North, LLC And Mec South LLC	MARSHALL ENERGY CENTER LLC	MI	Willard Ladd	6/29/2018	Natural gas combined cycle power plant (two plants: north and south)	There are two plants that will operate as separate entities and each received a separate Air Permit to Install, but they are considered one stationary source and were reviewed as one project.	EUCTGHRSG (North Plant): A combined-cycle natural gas-fired combustion turbine generator with heat recovery steam generator.	15.21	Natural gas	500	MW	Nominal 500 MW electricity production. Turbine rating of 3,080 MMBTU/hr (HHV) and HRSG duct burner rating of 755 MMBTU/hr (HHV). A combined-cycle natural gas-fired combustion turbine generator (CTG) with heat recovery steam generator (HRSG) in a 1x1 configuration with a steam turbine generator (STG) for a nominal 500 MW electricity production. The CTG is a H-class turbine with a rating of 3,080 MMBTU/hr (HHV). The HRSG is equipped with a natural gas-fired duct burner rated at 755 MMBTU/hr (HHV) at ISO conditions to provide heat for additional steam production. The HRSG is not capable of operating independently from the CTG. The CTG/HRSG is equipped with dry low NOx burner (DLNB), SCR, and an oxidation catalyst.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	1,978,297	T/YR	12-MO ROLL TIME PERIOD
Montgomery County Power Station	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			Combined Cycle Turbine	15.21	NATURAL GAS	2,635	MMBTU/HR/UNIT	Two Mitsubishi M501GAC turbines (without fast start)	Carbon Dioxide Equivalent (CO2e)	PIPELINE QUALITY NATURAL GAS, GOOD COMBUSTION PRACTICES	884	LB/MWH	
Montgomery County Power Station	ENTERGY TEXAS INC	TX	Christopher Burke	3/30/2018			COMBINED CYCLE TURBINE MSS REDUCED LOAD	15.21	NATURAL GAS			9 HOURS STARTUP, 1 HOUR SHUTDOWN	Carbon Dioxide Equivalent (CO2e)	minimizing duration of startup / shutdown events, engaging the pollution control equipment as soon as practicable (based on vendor recommendations and guarantees), and meeting the emissions limits on the MAERT	223	TON/H	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Harrison County Power Plant	ESC HARRISON COUNTY POWER, LLC	WV	Andrew Dorn	3/27/2018	Nominal 640 mWe natural gas-fired combined-cycle power plant. Small sources: Emergency Generator, Fire Water Pump, Fuel Gas Heater not included in RBLC - may request info or see permit for details.		GE 7HA.02 Turbine	15.21	Natural Gas	3,496	MMBtu/hr	Nominal 640 mWe All emission limits steady-state and include 1000 mmBtu/hr Duct Burner in operation Short Term startup and shutdown limits in lb/event given in permit.	Carbon Dioxide Equivalent (CO2e)	Use of Natural Gas, Model GE7HA	528,543	LB/HR	
Dania Beach Energy Center	FLORIDA POWER AND LIGHT COMPANY	FL	John Hampp	12/4/2017	1200 megawatt 2-on-1 combined cycle facility, natural gas-fired, with limited ULSD use. GE 7HA turbines	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.017.AC.D.ZIP	2-on-1 combined cycle unit (GE 7HA)	15.21	Natural gas	4,000	MMBtu/hr	Two nominal 430 MW combustion turbines, coupled to a steam turbine generator	Carbon Dioxide	Low-emitting fuels	850	LB/MWH	FOR GAS OPERATION, 12-MO ROLLING
Filer City Station	FILER CITY STATION LIMITED PARTNERSHIP	MI	Allen Adkins	11/17/2017	New natural gas combined heat and power plant proposed at existing cogenerating power plant permitted to burn wood, coal and tire derived fuel.		EUCCT (Combined cycle CTG with unfired HRSG)	15.21	Natural gas	1,935	MMBTU/H	A 1,934.7 MMBTU/H natural gas fired heavy frame industrial combustion turbine. The turbine operates in combined-cycle with an unfired heat recovery steam generator (HRSG).	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	992,286	T/YR	12-MO.ROLL.TIME PERIOD
Killingly Energy Center	NTE CONNECTICUT, LLC	CT	Mark Mirabito	6/30/2017	550 MW Combined Cycle Plant		Natural Gas w/o Duct Firing	15.21	Natural Gas	2,969	MMBtu/hr	Throughput is for turbine only	Carbon Dioxide Equivalent (CO2e)	Use of low carbon fuel	7,273	BTU/KW-HR	12-MONTH ROLLING (NET PLANT, GAS ONLY)
Gaines County Power Plant	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	DAVID LOW	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS		MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Carbon Dioxide Equivalent (CO2e)	Pipeline quality natural gas	960	LB / MW H	
Gaines County Power Plant	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Combined Cycle Turbine with Heat Recovery Steam Generator, fired Duct Burners, and Steam Turbine Generator	15.21	NATURAL GAS	426	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines with HRSGs and Steam Turbine Generators	Carbon Dioxide Equivalent (CO2e)	Pipeline quality natural gas	960	LB / MW H	
Chocolate Bayou Steam Generating (Cbsg) Station	INEOS USALLC	TX	Theresa Vitek	2/17/2017	support facility providing steam and electricity		Combined Cycle Cogeneration	15.21	NATURAL GAS	50	MW	2 UNITS EACH 50 MW GE LM6000	Carbon Dioxide Equivalent (CO2e)		1,000	LB/MW H	
Indeck Niles, LLC	INDECK NILES, LLC	MI	Michael Dubois	1/4/2017	Natural gas combined cycle power plant.	The permit includes equipment not entered into the RBLC due to a lack of emission limits or material limits; these include a cold cleaner, a number of space heaters, and two fuel tanks.	FGCTGHRSG (2 Combined Cycle CTGs with HRSGs)	15.21	Natural gas	8,322	MMBTU/H	There are 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) identified as EUCTGHRSG1 & EUCTGHRSG2 in the flexible group FGCTGHRSG. The total hours for startup and shutdown for each train shall not exceed 500 hours per 12-month rolling time period. The throughput capacity is 3421 MMBTU/H for each turbine, and 740 MMBTU/H for each duct burner for a combined throughput of 4161 MMBTU/H or 8322 MMBTU/H for both trains.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	2,097,001	T/YR	12-MONTH ROLLING TIME PERIOD

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Holland Board Of Public Works - East 5Th Street	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/5/2016	Natural gas combined heat and power plant.	Permit Number 107-13E revised Permit 107-13C as follows: 1) All ppmdv limits were changed to ppmvd in the CTGHRSG section for NOx, CO and VOC. Also, 2) The process notes for the natural gas emergency engine and the diesel fire pump emergency engine were revised as well. No other changes were made. As such, this RBLC entry includes the updated information as identified above. Additionally, this is an updated determination for this facility, which is still under construction and has not yet operated. The original RBLC determination for the facility is identified as MI-0412.	FGCTGHRSG (2 Combined cycle CTGs with HRSGs; EUCTGHRSG10 EUCTGHRSG11)	15.21	Natural gas	554	MMBTU/H, each	Two combined cycle natural gas fired combustion turbine generators (CTGs) with heat recovery steam generators (HRSG) (EUCTGHRSG10 & EUCTGHRSG11 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	312,321	T/YR	12-MO. ROLLING TIME PERIOD; EACH EU.
Decordova Steam Electric Station (Decordova Station)	DECORDOVA II POWER COMPANY LLC	TX	Paul Barnes	10/4/2016	two combustion turbines (CTGs) authorized to operate in simple cycle or combined cycle.	The simple cycle operations were issued in 2013, but the combined cycle criteria pollutant PSD permit / state amendment was issued on March 8, 2016. This GHG initial review is linked to the 2016 action which added combined cycle capability, it does not apply to the simple cycle operations which were authorized in 2013.	Combined Cycle and Cogeneration (>25 MW)	15.21	natural gas	213	MW	Two turbine options: GE 7FA [210 megawatts (MW)] or Siemens 5000F (231MW)	Carbon Dioxide Equivalent (CO2e)	good combustion practices and firing low carbon fuel.	966	LB/MW H	
Cpv Fairview Energy Center	CPV FAIRVIEW, LLC	PA		9/2/2016	This plan approval authorizes CPV Fairview, LLC to construct and temporarily operate the Fairview Energy Center. Air contamination sources and air cleaning devices authorized for construction and temporary operation under this plan approval include: A combined cycle electric generating unit consisting of two (2) General Electric (GE) 7HA.02 H-class combustion turbines each with maximum fuel type-based heat input of 3,338-MMBtu/hr (natural gas), 3,274-MMBtu/hr (ULSD), 3,199 MMBtu/hr (ethane blend), and equipped with dry low-NOx combustors and evaporative turbine intake cooling; two (2) heat recovery steam generators (HRSGs) each equipped with a low-NOx duct burner with maximum heat input of 425-MMBtu/hr, and a common steam turbine generator. Exhaust emissions from each combined cycle electric generating unit will be controlled by oxidation catalyst and selective catalytic reduction (SCR). - One (1) up to 12-cell mechanical draft wet cooling tower with high-efficiency drift eliminator. - One (1) natural gas-fired auxiliary boiler with maximum heat input of 92.4 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 12.8 MMBtu/hr. - One (1) natural gas-fired dew point heater with maximum heat input of 3.2 MMBtu/hr. - Two (2) 1,500-ekW diesel-fired emergency genset engines. - One (1) 422-bhp diesel-fired fire water pump engine. - One (1) 1,000,000-gallon ULSD storage tank. - Eight (8) sulfur hexafluoride (SF6) circuit breakers. - Plant roadways. - Natural gas and ethane blend piping components.		Combustion turbine and HRSG with duct burner NG only	15.21	Natural Gas	3,338	MMBtu/hr	Emission limits are for each turbine operating with duct burner and do not include startup/shutdown emissions. Tons per year limits is a cumulative value for all three CCCT. CEMS for NOx, CO, and O2. Each CCCT and duct burner have 5 operational scenarios: 1 CCCT with duct burner fired - fueled by NG only 2 CCCT with duct burner fired - fueled by NG blend with ethane 3 CCCT without duct burner fired - fueled by NG only 4 CCCT without duct burner fired - fueled by NG blend with ethane 5 CCCT without duct burner fired - fueled by ULSD (Limited to emergency use only)	Carbon Dioxide Equivalent (CO2e)	low sulfur fuel and good combustion practices	3,352,086	TONS	12-MONTH ROLLING BASIS
St. Charles Power Station	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1A	15.21	Natural Gas	3,625	MMBTU/hr		Carbon Dioxide Equivalent (CO2e)	Thermally efficient combustion turbines and good combustion practices			

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
St. Charles Power Station	ENTERGY LOUISIANA, LLC	LA		8/31/2016	The St. Charles Power Station (SCPS) is a new electric power generating facility consisting of two (2) natural gas-fired combined cycle gas turbines, each with a heat recovery stem generator unit equipped with duct burners, and one (1) steam generator turbine. The SCPS will have a predicted net nominal output of 980 MW at ISO conditions with supplemental duct firing.		SCPS Combined Cycle Unit 1B	15.21	Natural Gas	3,625	MMBTU/hr		Carbon Dioxide Equivalent (CO2e)	Thermally efficient combustion turbines and good combustion practices			
Middlesex Energy Center, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas with Duct Burner	15.21	natural gas	4,000	h/yr		Carbon Dioxide Equivalent (CO2e)	USE OS NATURAL GAS A CLEAN BURNING FUEL	888	LB/MW-H	BASED ON CONSECUTIVE 12 MONTH ROLLING
Middlesex Energy Center, LLC	STONEGATE POWER, LLC	NJ	David Himelman	7/19/2016	NEW 633 MEGAWATT (MW) GROSS FACILITY CONSISTING OF 1. ONE GENERAL ELECTRIC (GE) 7HA.02 CCCT NOMINALLY RATED AT 380 MW AT ISO CONDITIONS WITHOUT DUCT FIRING WITH A MAXIMUM HEAT INPUT RATE OF: O 3,462 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING NATURAL GAS O 3,613 MMBTU/HR(HHV) AT (0) DEGREES F, 100% LOAD COMBUSTING ULSD WHICH WILL BE THE BACKUP FUEL OTHER EQUIPMENT INCLUDES: 2. ONE NATURAL GAS-FIRED DUCT BURNER (MAXIMUM HEAT INPUT OF 599 MMBTU/HR(HHV)) FOR SUPPLEMENTAL FIRING. 3. ONE 97.5 MMBTU/HR(HHV) NATURAL GAS FIRED AUXILIARY BOILER, EQUIPPED WITH LOW NOX BURNERS AND FLUE GAS RECIRCULATION FOR CONTROL OF NOX EMISSIONS; 4. ONE 2.25 MMBTU/HR(HHV), 327 BRAKE HORSEPOWER, ULSD FIRED EMERGENCY FIRE PUMP; 5. ONE 14.4 MMBTU/HR(HHV), APPROXIMATELY 1,500 KW ULSD FIRED EMERGENCY GENERATOR; AND 6. ONE 8-CELL, 124,800 GALLON PER MINUTE (GPM) MECHANICAL INDUCED DRAFT COOLING TOWER.		Combined Cycle Combustion Turbine firing Natural Gas without Duct Burner	15.21	Natural Gas	8,040	H/YR		Carbon Dioxide Equivalent (CO2e)	USE OF NATURAL GAS A CLEAN BURNING FUEL	888	LB/MW-H	BASED ON CONSECUTIVE 12 MONTH ROLLING
Eagle Mountain Steam Electric Station	EAGLE MOUNTAIN POWER COMPANY	TX	Paul Coon	7/19/2016	Electric Generation		Combined Cycle Cogeneration	15.21	natural gas	462	MW		Carbon Dioxide Equivalent (CO2e)	Good Combustion Practices	917	LB/MW H	
Greensville Power Station	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Mark Mitchell	6/17/2016	The proposed project will be a new, nominal 1,600 MW combined-cycle electrical power generating facility utilizing three combustion turbines each with a duct-fired heat recovery steam generator (HRSG) with a common reheat condensing steam turbine generator (3 on 1 configuration). The proposed fuel for the turbines and duct burners is pipeline-quality natural gas.		COMBUSTION TURBINE GENERATOR WITH DUCT-FIRED HEAT RECOVERY STEAM GENERATORS (3)	15.21	natural gas	3,227	MMBTU/HR	3227 MMBTU/HR CT with 500 MMBTU/HR Duct Burner, 3 on 1 configuration.	Carbon Dioxide Equivalent (CO2e)		890	LB/MWH	NET OUTPUT AFTER 30 YEARS OF OPERATION
Johnsonville Cogeneration	TENNESSEE VALLEY AUTHORITY	TN	Clay Cherry	4/19/2016	Existing gas-fired combustion turbine with new heat recovery steam generator (HRSG) with duct burner and two new gas-fired auxiliary boilers.	Facility-wide emissions increases do not include decreases due to shutdown of coal-fired units.	Natural Gas-Fired Combustion Turbine with HRSG	15.21	Natural Gas	1,339	MMBtu/hr	Turbine throughput is 1019.7 MMBtu/hr when burning natural gas and 1083.7 MMBtu/hr when burning No. 2 oil. Duct burner throughput is 319.3 MMBtu/hr. Duct burner firing will occur during natural gas combustion only.	Carbon Dioxide Equivalent (CO2e)	Good combustion design and practices	1,800	LB/MWH	12-MONTH MOVING AVERAGE
Neches Station	APEX TEXAS POWER LLC	TX	DAVID JENKINS	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas		MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/yr.	Carbon Dioxide Equivalent (CO2e)	GOOD COMBUSTION PRACTICES	924	LB/MWH	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Neches Station	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Combined Cycle Cogeneration	15.21	natural gas	231	MW	2 CTGs to operate in simple cycle & combined cycle modes. 231 MW (Siemens) or 210 MW (GE) Simple cycle operations limited to 2,500 hr/yr.	Carbon Dioxide Equivalent (CO2e)	GOOD COMBUSTION PRACTICES	924	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 megawatts (MW))	15.21	natural gas	889	MW	(2) GE 7HA.01 in a 2x1 configuration and a 872 million British thermal units per hour (MMBtu/hr) duct burner	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	901	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 MW)	15.21	natural gas	1,127	MW	(2) GE 7HA.02 in a 2x1 configuration and a 985 MMBtu/hr duct burner	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	865	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 MW)	15.21	natural gas	748	MW	(2) GE 7FA.05 in a 2x1 configuration and a 826 MMBtu/hr duct burner	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	944	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 MW)	15.21	natural gas	889	MW	(2) MHI 501GAC in a 2x1 configuration and a 221 MMBtu/hr duct burner	Carbon Dioxide Equivalent (CO2e)	good combustion practices	929	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 MW)	15.21	natural gas	889	MW	(2) MHI 501GAC in (2) 1x1 configurations and a 221 MMBtu/hr duct burner	Carbon Dioxide Equivalent (CO2e)	good combustion practices	929	LB/MWH	
Rockwood Energy Center	ROCKWOOD ENERGY CENTER, LLC	TX	Jason Tundermann	3/18/2016	power plant operating in combined cycle mode consisting of two turbines each with duct burners, both fired on natural gas, and a heat recovery steam generator. The applicant has proposed six potential turbine models with different duct burner maximum heat input rates for each option. Only one will be constructed.		Combined Cycle Cogeneration (25 MW)	15.21	natural gas	915	MW	(2) Siemens SCC6-8000H(1.4) in a 2x1 configuration and a 326 MMBtu/hr duct burner	Carbon Dioxide Equivalent (CO2e)	good combustion practices	965	LB/MWH	
Pseg Fossil LLC Sewaren Generating Station	PSEG FOSSIL LLC	NJ	DOUGLAS GORDON	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (âcægpmâ) auxiliary wet mechanical draft cooling tower	Combined Cycle Combustion Turbine with Duct Burner firing natural gas	15.21	Natural Gas				Carbon Dioxide	Use of natural gas which is a clean burning fuel	888	LB/MW-H	CONSECUTIVE 12 MONTH ROLLING MONTHLY

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Pseg Fossil LLC Sewaren Generating Station	PSEG FOSSIL LLC	NJ	DOUGLAS GORDON	3/10/2016	PSEG Fossil LLC Sewaren Generating Station (Sewaren or Facility) is located at 751 Cliff Road, Sewaren, New Jersey 07077-1439, Middlesex County, New Jersey. This Project to be built at Sewaren would be a 1-on-1 (1 combustion turbine and a single steam turbine) combined-cycle electric generating unit including its ancillary equipment. The electric output of the combined-cycle combustion turbine (CCCT) at ISO conditions will be approximately 345 MW and the approximate output of the steam turbine at these conditions and with 100% supplemental heat input will be 240 MW.	A. The Facility Wide emission Increase given below is from this project. B. The Project will consist of the following equipment: [1] One (1) General Electric (GE) 7HA.02 CCCT nominally rated at 345 MW at ISO conditions without duct firing with a maximum heat input rate of: 3,311 MMBtu/hr(HHV) at (94) degrees F, 47% RH firing natural gas 3,452 MMBtu/hr(HHV) at (0) degrees F, and 50% RH when firing ULSD [2.] One (1) 730 MMBtu/hr (HHV) natural gas-fired duct burner [3] One (1) 80 MMBtu/hr (HHV) natural gas fired auxiliary boiler [4] One (1) 2.60 MMBtu/hr (HHV), 360 brake horsepower, emergency diesel fire pump, [5] One (1) 19.1 MMBtu/hr (HHV), approximately 2,000 kW emergency diesel generator, and, [6] A 3-cell, 13,000 gallon per minute (âcægpmâ) auxiliary wet mechanical draft cooling tower	Combined Cycle Combustion Turbine without Duct Burner Firing Natural Gas	15.21	Natural Gas		MMBTU/YR	Natural Gas Usage: <=28,169,501 MMBtu/year which includes maximum ultra low sulfur distillate oil usage of =2,371,943 MMBTU/year	Carbon Dioxide		888	LB/MW-H	CONSECUTIVE 12 MONTH ROLLING MONTHLY
Okeechobee Clean Energy Center	FLORIDA POWER & LIGHT	FL	John Hampp	3/9/2016	Fossil-fueled power plant, consisting of a 3-on-1 combined cycle unit and auxiliary equipment. The combined cycle unit consists of three GE 7HA.02 turbines, each with nominal generating capacity of 350 MW. The total generating capacity for the combined cycle unit is 1,600 MW.	Technical evaluation of project available at http://depedms.dep.state.fl.us/Oculus/servlet/shell?command=getEntity&[guid=75.89000.1]&[profile=Permitting_Authorization]	Combined-cycle electric generating unit	15.21	Natural gas	3,096	MMBtu/hr per turbine	3-on-1 combined cycle unit. GE 7HA.02 turbines, approximately 350 MW per turbine. Total unit generating capacity is approximately 1,600 MW. Primarily fueled with natural gas. Permitted to burn the base-load equivalent of 500 hr/yr per turbine on ULSD.	Carbon Dioxide Equivalent (CO2e)	Use of low-emitting fuels and technologies	850	LB/MWH	FOR GAS OPERATION, 12-MO ROLLING
Trinidad Generating Facility	SOUTHERN POWER	TX	Kelli Mccullough	3/1/2016	Electric Generation		Combined Cycle Cogeneration	15.21	natural gas	497	MW		Carbon Dioxide Equivalent (CO2e)	Good Combustion Practices	937	LB/MW HR	
Tenaska Pa Partners/ Westmoreland Gen Fac	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas			This process entry is for operations with the duct burner. Limits entered are for each turbine.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	1,881,905	TPY	
Tenaska Pa Partners/ Westmoreland Gen Fac	TENASKA PA PARTNERS LLC	PA		2/12/2016	The plan approval will allow construction and temporary operation of a power plant is a single 2 on 1 combined cycle turbine configuration with 2 combustion turbines serving a single steam turbine generator equipped with heat recovery steam generator with supplemental 400MMBtu/hr natural gas fired duct burners. The approximate maximum plant nominal generating capacity is 930-1065 MW. Additional facilities will include 245 MMBtu/hr Auxiliary Boiler, one cooling tower, one diesel-fired emergency generator, and one diesel-fired emergency fire pump engine.	Application for plan approval 65-00990E received on 12/10/2015 from Tenaska to reduce the facility wide PTE authorized under plan approval 65-00990C based on revised emission information for startup and shutdown from the manufacturer.	Large combustion turbine	15.21	Natural Gas	0		This process entry is for operations with the duct burner. Limits entered are for each turbine.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	1,881,905	TPY	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Cricket Valley Energy Center	CRICKET VALLEY ENERGY CENTER LLC	NY		2/3/2016	Cricket Valley Energy Center LLC (CVEC) constructed the Cricket Valley Energy Center (the Facility), a nominal net 1,000-megawatt (MW) combined-cycle gas turbine electric generating facility, on a site located in Dover, Dutchess County, New York. The Facility consists of three General Electric (GE) Model 7FA.05 combustion turbine generators (CTGs) operating in combined-cycle mode with supplemental firing of the heat recovery steam generators (HRSGs); natural gas will be the sole fuel fired in the CTGs and duct burners. The Facility will include a natural gas-fired auxiliary boiler, four ultra-low sulfur distillate (ULSD) fired black-start generator engines and a ULSD-fired emergency fire pump engine. In addition to the air emitting equipment, the Facility will include three steam turbine generators (STGs), an air cooled condenser (ACC) and associated auxiliary equipment and systems. Each combined cycle generating unit consisting of the CTG, HRSG and STG will be exhausted through its own stack. Air emissions from the proposed Facility primarily consist of products of combustion from the CTGs, HRSG duct burners, and ancillary combustion sources. Dutchess County is designated as in attainment with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants with the exception of ozone. Based upon the potential to emit (PTE) estimates, the Facility is subject to Prevention of Significant Deterioration (PSD) requirements for emissions of carbon monoxide (CO); nitrogen oxides (NOx); particulate matter (PM) with a diameter equal to or less than 10 microns (PM10), PM with a diameter equal to or less than 2.5 microns (PM2.5); greenhouse gases (GHG); sulfuric acid mist (H2SO4); and volatile organic compounds (VOC). In accordance with the NYSDEC's Nonattainment New Source Review (NNSR) permitting program, the Facility is also subject to NNSR for emissions of NOx and VOC.		Turbines and duct burners	15.21	natural gas		mw		Carbon Dioxide Equivalent (CO2e)	max heat rate 7,604 btu/kw-h HHV without duct firing good combustion practice and burning natural gas			
Lackawanna Energy Ctr/Jessup	LACKAWANNA ENERGY CENTER, LLC	PA		12/23/2015	This plan approval is for the construction and temporary operation of three (3) identical General Electric Model 7HA.02 natural gas fired combustion turbines and heat recovery steam generator with duct burners (CT/HRSG). Each CT/HRSG combined-cycle process block includes one (1) combustion gas turbine and one (1) heat recovery steam generator with duct burners with all three (3) CT/HRSG sharing one (1) steam turbine. The entire power block is rated at 1,500 MW. Additional equipment includes: one (1) 2,000 kW diesel-fired emergency generator one (1) 315 HP diesel-fired emergency fire water pump one (1) 184.8 MM BTU/hr natural gas fired boiler one (1) 12 MMBTU/hr natural gas fuel gas heater two (2) Diesel fuel storage tanks four (4) lubricating oil tanks one (1) aqueous ammonia storage tank		Combustion turbine with duct burner	15.21	Natural gas	3,304	MMBtu/hr	Limits are for each CCCT and yearly limits are for cumulative turbine and duct burner. Duct burner throughput is 637.9 MMBtu/hr.	Carbon Dioxide Equivalent (CO2e)		1,629,115	TONS	YEAR
Cpv Towantic, LLC	CPV TOWANTIC, LLC	CT	Andrew Bazinet	11/30/2015	805 MW Combined Cycle Plant		Combined Cycle Power Plant	15.21	Natural Gas	21,200,000	MMBtu/yr		Carbon Dioxide		809	LB/MWH	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Mattawoman Energy Center	MATTAWOMAN ENERGY, LLC	MD	Steven Tessem	11/13/2015	990 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTNOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE). THE FACILITY INCLUDES A WET MECHANICAL DRAFT COOLING TOWER (12 CELL) with 0.0005% RECIRCULATING WATER FLOW.	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	286	MW	TWO SIEMENS H-CLASS (SGT-8000H VERSION 1.4-OPTIMIZED) COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 286 MW (EACH), COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST. HEAT RATE LIMITED TO 6,793 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR MATTAWOMAN TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS MATTAWOMAN PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Carbon Dioxide Equivalent (CO2e)		865	LB/MW-H	12-MONTH ROLLING AVERAGE
Fge Eagle Pines Project	FGE EAGLE PINES, LLC	TX	Emerson Farrell	11/4/2015	The FGEEP Project will include three natural gas-fired combined cycle (NGCC) power blocks, each block comprised of two gas-fired combustion turbines, two supplemental fired duct burners (DBs) heat recovery steam generators (HRSGs), and one steam turbine. FGEEP selected Alstom GT36 combustion turbines (CTs), each nominally rated at 321 megawatts (MW). Each HRSG is equipped with DBs that will have a maximum design heat input capacity of 799 million British thermal units per hour (MMBtu/hr). The CTs and DBs are fueled with pipeline quality natural gas. Each power block will also have a steam turbine generator designed to produce approximately 502 MW with the additional duct firing. Each of the three blocks will include the following ancillary equipment: one multi-cell condenser/cooling tower, one emergency generator, one firewater pump, two diesel storage tanks, and pressurized aqueous ammonia storage tanks.		Combined Cycle Turbines (>25 MW)	15.21	natural gas	321	MW	Alstom GT36 combustion turbines (321 MW)+ 799 million British thermal units per hour (MMBtu/hr) duct burner	Carbon Dioxide Equivalent (CO2e)	Low carbon fuel, good combustion, efficient combined cycle design	886	LB/MW H	WITHOUT DUCT FIRING
Sr Bertron Electric Generating Station	NRG TEXAS POWER	TX	CRAIG ECKBERT	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Combined cycle and cogeneration turbines greater than 25 MW firing natural gas	15.21	natural gas		MMBTU/H	GE 7HA 359 MW +a 301 million British thermal units per hour (MMBtu/hr) duct burner (DB) GE7FA 215 MW + 523 MMBtu/hr DB SF5 225 MW + 688 MMBtu/hr DB MHI510G 263 MW + 686 MMBtu/hr DB	Carbon Dioxide		825	LB /MW H	
Cedar Bayou Electric Generating Station	NRG TEXAS POWER	TX	CRAIG ECKBERT	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Combined cycle and cogeneration turbines greater than 25 MW	15.21	natural gas		MMBTU/H	4 turbines options GE 7HA 359 MW +a 301 million British thermal units per hour (MMBtu/hr) duct burner (DB) GE7FA 215 MW + a 523 MMBtu/hr DB SF5 225 MW + 688 MMBtu/hr DB MHI510G 263 MW + 686 MMBtu/hr DB	Carbon Dioxide		825	LB CO2/MWH	
Sr Bertron Electric Generating Station	NRG TEXAS POWER	TX	Craig Eckbert	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Combined cycle and cogeneration turbines greater than 25 MW firing natural gas	15.21	natural gas	301	MMBTU/H	GE 7HA " 359 MW +a 301 million British thermal units per hour (MMBtu/hr) duct burner (DB) GE7FA " 215 MW + a 523 MMBtu/hr DB SF5 " 225 MW + 688 MMBtu/hr DB MHI510G " 263 MW + 686 MMBtu/hr DB	Carbon Dioxide		825	LB /MW H	
Cedar Bayou Electric Generating Station	NRG TEXAS POWER	TX	Craig Eckbert	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Combined cycle and cogeneration turbines greater than 25 MW	15.21	natural gas	301	MMBTU/H	4 turbines options GE 7HA " 359 MW +a 301 million British thermal units per hour (MMBtu/hr) duct burner (DB) GE7FA " 215 MW + a 523 MMBtu/hr DB SF5 " 225 MW + 688 MMBtu/hr DB MHI510G " 263 MW + 686 MMBtu/hr DB	Carbon Dioxide		825	LB CO2/MWH	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Moxie Freedom Generation Plant	MOXIE FREEDOM LLC	PA		9/1/2015	The Project is for the construction and operation of two identical 1 x 1 power blocks, each consisting of a combustion gas turbine (CGT or CT) and a steam turbine (ST) configured in single shaft alignment, where each CT and ST train share one common electric generator. The turbines to be used for this project are Two General Electric (GE) 7HA.02 CTs, each in 1 x 1 single shaft combined- cycle power islands. Each CT and duct burner will exclusively fire pipeline-quality natural gas. The HRSGs will be equipped with selective catalytic reduction (SCR) to minimize nitrogen oxide (NOx) emissions and oxidation catalysts to minimize carbon monoxide (CO) and volatile organic compound (VOC) emissions from the CTs and DB™s. The Project will also include several pieces of ancillary equipment. The list of equipment includes: One fuel gas dew-point heater - natural gas fired, common for all CTs Two CT inlet evaporative coolers - one for each CT (not emissions sources) Two air-cooled condensers (ACCs) - one for each HRSG (not emissions sources) One auxiliary boiler, natural gas-fired One diesel engine powered emergency generator One diesel engine powered fire water pump Diesel fuel, lubricating oil, and aqueous ammonia storage tanks The project once operational will produce 1050 MW Electric Generation		Combustion Turbine With Duct Burner	15.21	Natural Gas	3,727	MMBtu/hr	DLN burner, SCR, Oxidation Catalyst and shall maintain and operate the sources and associated air cleaning devices in accordance with good engineering practice. shall install, certify, maintain and operate continuous emission monitoring systems (CEMS) for nitrogen oxides, carbon monoxide, carbon dioxide, and ammonia emissions on the exhaust of each combined-cycle powerblock. Emissions limits are for each combustion turbine/duct burner block.	Carbon Dioxide Equivalent (CO2e)		1,000	LB CO2/MWH	GROSS ON A 12-MONTH ROLLING BASIS
The Empire District Electric Company	THE EMPIRE DISTRICT ELECTRIC COMPANY	KS	Jeff Burkett	7/14/2015	The Empire District Electric Company " Riverton Plant (EDEC) (Source ID: 0210002) is a fossil fuel electricity generation facility located in Cherokee County, Kansas.	This PSD permit with tracking number C-12987 is a modification of PSD permits C-12670 (Administrative Amendment, issued on 2/19/2015) and C-10913 (original PSD Permit for the proposed project, issued on 7/11/2013).	Combined cycle combustion turbine	15.21	Natural gas	250	MW	Combined cycle combustion unit; this unit includes a heat recovery steam generator (HRSG) with supplemental natural gas duct firing (duct burners) and a condensing steam turbine generator with SCR and CO catalyst.	Carbon Dioxide Equivalent (CO2e)		1,022,756	TONS PER YEAR	12-MONTH ROLLING AVERAGE
Shell Chem Appalachia/ Petrochemicals Complex	SHELL CHEMICAL APPALACHIA	PA		6/18/2015	The plan approval will allow the construction and temporary operation of seven (7) 620 MMBtu/hr ethane cracking furnaces fired primarily by tail gas and natural gas for the production of approximately 1.5 million metric tons/year of polyethylene. Byproducts from the ethylene production include coke residue/tar, light gasoline, pyrolysis fuel oil, and a C3+ mixture and will be remove from the site for disposal or use as appropriate. Additional facilities include an electric and steam cogeneration from three (3) combustion turbines with duct burners and heat recovery steam generators with a plant capacity of 250.4 MW, four (4) emergency generators, three (3) diesel-fired fire pump engines, cooling towers, flares, and storage tanks.	(7) 620.000 MMBtu/hr Ethane cracking furnaces, (3) 664.000 combustion turbines with duct burners. Shell intends to convert ethane in to ethylene for manufacturing of various grades of low density and high density polyethylene as a final product.	Combustion turbine with duct burner and heat recovery steam generator	15.21	Natural Gas		Three 40.6 MW turbines	Three (3) General Electric Frame 6B NG fired turbine with duct burners and heat recovery steam generators. Total electric generating capacity will be 250.4 MW from cogeneration three turbines at 40.6 MW and two HRSG at 64.3 MW. Excess electricity generated will be sold to the grid in quantities sufficient to classify the facility as an electric utility.	Carbon Dioxide Equivalent (CO2e)		1,030	CO2E/MWH	30 DAY ROLLING AVG*
York Energy Center Block 2 Electricity Generation Project	CALPINE MID-MERIT, LLC	PA		6/15/2015	Calpine Mid-Merit, LLC. currently operates Block 1 of the York Energy Center under Title V operating permit 67-05083 with a rated capacity of 565 MW. This plan approval is for the construction and temporary operation of Block 2 Electricity Generation Project having a nominal generating capacity of 835 MW. Block 2 consists of two combined cycle NG/USLD fuel fired combustion turbines, one NG-fired auxiliary boiler, one cooling tower, NG piping components, circuit breaker upgrades, five NG condensate tanks, and additional ULSD fuel oil storage tank. Each CT will be limited to 4500 hr/yr with duct firing; 480 hr/yr of ULSD		Two Combine Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	3,002	MCF/hr	Two (2) Combustion Turbine, 235 MW / 2512.5 MMBtu/hr, will fire NG and with the design having no bypass from the CT to HRSG the CT will always be in combined cycle mode the HRSG with NG-fired Duct Burner maximum rated heat input capacity 722 MMBtu/hr. CT will employ dry low NOx burner technology (NG firing), controlled by SCR and oxidation catalyst. . (Operational limits are for each CCCT NG-fired with duct burner)	Carbon Dioxide Equivalent (CO2e)	Good combustion practices and oxidation catalyst	883	LB/MW-HR	EXPRESSED AS CO2E (NET)
Cash Creek Generating Station	CASH CREEK GENERATION, L.L.C	KY	MIKE MCINNUS	6/10/2015	natural gas fired combined cycle power plant		Combined cycle combustion turbine with HRSG and duct firing	15.21	Natural gas pipeline quality		MW	Two CT with HRSGs with duct burner Max fuel input for CTs and HRSGs 6,714 MMBtu/hr HHV Max Gross output 849 MW at 0F	Carbon Dioxide Equivalent (CO2e)	Combust only pipeline quality natural gas	884	LB/MWH	12 MONTH ROLLING AVERAGE
Colorado Bend Energy Center	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Carbon Dioxide	efficient processes, practices, and designs	879	LB/MWH	
Moundsville Combined Cycle Power Plant	MOUNDSVILLE POWER, LLC	WV	Jon Williams	11/21/2014	Nominal 549 mW(output) natural gas-fired combined cycle power plant.		Combined Cycle Turbine/Duct Burner	15.21	Natural Gas	2,420	MMBtu/Hr	This entry is for both of two identical units at the facility. Nominal 197 mW General Electric Frame 7FA.04 Turbine w/ Duct Burner - throughput denotes aggregate heat input of turbine and duct burner (HHV).	Carbon Dioxide Equivalent (CO2e)	Use of GE Frame 7EA CT Low Carbon Fuel	272,556	LB/H	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Keys Energy Center	KEYS ENERGY CENTER, LLC	MD	John J. Doran	10/31/2014	735 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANT NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	NOTE: PARTICULATE MATTER FACILITYWIDE EMISSIONS ARE PARTICULATE MATTER (FILTERABLE)	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	235	MW	TWO SIEMENS F-CLASS (SGT6-500FEE) SERIES COMBUSTION TURBINES (CTS) WITH DUCT BURNERS, WITH A NOMINAL GENERATING CAPACITY OF 735 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), DRY LOW-NOX COMBUSTORS, SCR, OXIDATION CATALYST, AND FUELED EXCLUSIVELY ON PIPELINE QUALITY NATURAL GAS. HEAT INPUT LIMITED TO 6,802 BTU/KWH (NET) AT ALL TIMES WHEN THE CTS/HRSGS ARE OPERATING (LHV). INITIAL COMPLIANCE WITH THE HEAT RATE LIMITATION SHALL BE DEMONSTRATED USING ASME PTC-46 TEST METHOD. ANNUAL THERMAL EFFICIENCY TEST CONDUCTED ACCORDING TO ASME PTC-46, OR ANOTHER METHODOLOGY APPROVED BY MDE-ARMA, AND COMPARE RESULTS TO DESIGN THERMAL EFFICIENCY VALUE. AN EXCEEDANCE OF THE HEAT RATE LIMIT IS NOT CONSIDERED A VIOLATION OF THIS PERMIT, BUT TRIGGERS A REQUIREMENT FOR KEYS TO SUBMIT A MAINTENANCE PLAN TO MDE-ARMA WHICH SPECIFIES THE ACTIONS KEYS PLANS TO TAKE IN ORDER TO ACHIEVE THE HEAT RATE LIMIT. THE PLAN SHALL INCLUDE A TIMEFRAME THAT THE HEAT RATE LIMIT WILL BE MET NOT TO EXCEED 60 DAYS UNLESS AGREED TO BY MDE-ARMA.	Carbon Dioxide	CO2 CEMS	869	LB/MW-H CO2	12-MONTH ROLLING AVERAGE
Lon C. Hill Power Station	LON C. HILL, LP	TX	Gary Clark	10/28/2014	Natural gas fired combined-cycle power plant		Large Combustion Turbine	15.21	Natural Gas	700	MW		Carbon Dioxide		920	LB/MW-H	12 MONTH ROLLING AVERAGE PER TURBINE
Austin Energy, Sand Hill Energy Center	CITY OF AUSTIN	TX	Ravi Joseph	9/29/2014	This project authorizes the construction of an additional combined cycle unit at the existing Sand Hill Energy Center (SHEC). The SHEC operates in a 1x1x1 configuration and the new unit will allow the SHEC to operate in a 2x2x1 configuration. New unit will generate an additional 222 MW of gross electrical power.	The Texas Commission on Environmental Quality is the permitting authority for non-GHG emissions associated with this project. See: CN600129118; RN100215052	Combustion Turbine with HRSG, Duct Burners, and SCR	15.21	Natural Gas	7,943	Btu/kWh (HHV, gross)	GE 7FA.04 Gross Heat Rate is with and without duct burner firing and includes MSS.	Carbon Dioxide Equivalent (CO2e)		930	LB CO2/MWH	365-DAY ROLLING AVERAGE
West Deptford Energy Station	WEST DEPTFORD ENERGY ASSOCIATES	NJ	Doug Mulvey	7/18/2014	An existing Electric Generating Facility with a PSD permit. A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility. The new project is subject to BACT/LAER	A new project consisting of a 427 MW Siemens Combined Cycle combustion turbine unit is being added to the existing facility	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural Gas	20,282	MMCF/YR	This is a 427 MW Siemens Combined Cycle Turbine with duct burner Heat Input rate of the turbine = 2276 MMBtu/hr (HHV) Heat Input rate of the Duct burner= 777 MMBtu/hr(HHV) The fuel use of 20,282 MMCF/YR is for three turbines and three Duct burners.	Carbon Dioxide Equivalent (CO2e)	Turbine efficiency and Use of Natural gas a clean burning fuel	1,237,923	TONS/YEAR	CONSECUTIVE 12 MONTH (ROLLING 1 MONTH)
Fge Power, Fge Texas Project	FGE POWER, LLC	TX	Emerson Farrell	4/28/2014	Authorizes FGE to construct a new combined cycle electric generating plant (FGETP) in Mitchell County, Texas. FGETP will generate 1,620 megawatts (MW) of gross electrical power near the City of Westbrook. The gross electrical power output is based on four combined cycle combustion turbines rated at nominal 230.7 MW each and two steam turbines with duct burner firing that are designed to produce an additional 336 MW each. FGE™s rated output for a single power block is 810 MW of gross electrical output. FGETP will consist of the following sources of GHG emissions: Four natural gas-fired CTGs (Alstom GT24) equipped with lean pre-mix low-NOx combustors; Four natural gas-fired duct burner system equipped heat recovery steam generators (HRSGs); Natural gas piping and metering; Two diesel fuel-fired emergency electrical generator engines; Two diesel fuel-fired fire water pump engines; and Electrical equipment insulated with sulfur hexafluoride (SF6).	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project. The CN and RN have not been assigned.	Combined Cycle Combustion Turbine with DB, HRSG and SCR	15.21	Natural Gas	7,625	Btu/kWh	The plant will consist of four identical Alstom GT24 natural gas-fired CTGs. The CTGs will burn pipeline quality natural gas to rotate an electrical generator to generate electricity. The exhaust gas will exit the CTG and be routed to the heat recovery steam generator (HRSG) for steam production. Steam produced by each of the two HRSGs will be routed to the steam turbine. The two CTGs and one steam turbine will be coupled to electric generators to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid. Each CTG has an approximate maximum base-load electric power output of 230.7 MW. The maximum electric power output from each steam turbine is approximately 336 MW. The units may operate at reduced load to respond to changes in system power requirements and/or stability.	Carbon Dioxide Equivalent (CO2e)		889	LB CO2/MWH, GROSS	APPLIES WITH OR WITHOUT DB; INCLUDES MSS
Fge Power, Fge Texas Project	FGE POWER, LLC	TX	Emerson Farrell	4/28/2014	Authorizes FGE to construct a new combined cycle electric generating plant (FGETP) in Mitchell County, Texas. FGETP will generate 1,620 megawatts (MW) of gross electrical power near the City of Westbrook. The gross electrical power output is based on four combined cycle combustion turbines rated at nominal 230.7 MW each and two steam turbines with duct burner firing that are designed to produce an additional 336 MW each. FGE™s rated output for a single power block is 810 MW of gross electrical output. FGETP will consist of the following sources of GHG emissions: Four natural gas-fired CTGs (Alstom GT24) equipped with lean pre-mix low-NOx combustors; Four natural gas-fired duct burner system equipped heat recovery steam generators (HRSGs); Natural gas piping and metering; Two diesel fuel-fired emergency electrical generator engines; Two diesel fuel-fired fire water pump engines; and Electrical equipment insulated with sulfur hexafluoride (SF6).	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project. The CN and RN have not been assigned.	Natural Gas Fugitive Emission Sources	15.21					Carbon Dioxide Equivalent (CO2e)				

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Cpv St. Charles	CPV MARYLAND, LLC	MD	Donald Atwood	4/23/2014	725 MW COMBINED-CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 96.6 TONS/YR FACILITY-WIDE SAM EMISISON LIMIT < 7.0 TONS/YR FACILITY-WIDE PM2.5 (TOTAL) EMISSION LIMIT < 100.0 TONS/YR	2 COMBINED-CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	725	MEGAWATT	TWO GENERAL ELECTRIC (GE) F-CLASS ADVANCED COMBINED CYCLE COMBUSTION TURBINES (CTS) WITH A NOMINAL GENERATING CAPACITY OF 725 MW, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX BURNERS, SCR, OXIDATION CATALYST	Carbon Dioxide Equivalent (CO2e)		7,109	BTU/KWH	@ ISO CONDITIONS
Marshalltown Generating Station	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #1 - combined cycle	15.21	natural gas	2,258	mmBtu/hr	two identical Siemens SGT6-5000F combined cycle turbines without duct firing, each at 2258 mmBtu/hr generating approx. 300 MW each.	Carbon Dioxide		951	LB/MW-H	12-MONTH ROLLING AVG.
Marshalltown Generating Station	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #1 - combined cycle	15.21	natural gas	2,258	mmBtu/hr	two identical Siemens SGT6-5000F combined cycle turbines without duct firing, each at 2258 MMBtu/hr generating approx. 300 MW each.	Carbon Dioxide Equivalent (CO2e)		1,318,647	TON/YR	12-MONTH ROLLING
Marshalltown Generating Station	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #2 - combined cycle	15.21	natural gas	2,258	MMBtu/hr		Carbon Dioxide		951	LB/MW-HR GROSS	12-MONTH ROLLING AVERAGE
Marshalltown Generating Station	INTERSTATE POWER AND LIGHT	IA	Alan Arnold	4/14/2014	Utility electric generating station	Two combined cycle turbines without duct burning.	Combustion turbine #2 - combined cycle	15.21	natural gas	2,258	MMBtu/hr		Carbon Dioxide Equivalent (CO2e)		1,318,647	TON/YR	12-MONTH ROLLING TOTAL
Wildcat Point Generation Facility	OLD DOMINION ELECTRIC CORPORATION (ODEC)	MD	David N. Smith	4/8/2014	1000 MEGAWATT COMBINED CYCLE NATURAL GAS-FIRED POWER PLANTFACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 278 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT = 272 TONS/YR FACILITY-WIDE SAM EMISSION LIMIT = 96 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 3,498,026 TONS/YR	2 COMBINED CYCLE COMBUSTION TURBINES, WITH DUCT FIRING	15.21	NATURAL GAS	1,000	MW	TWO MITSUBISHI G MODEL COMBUSTION TURBINE GENERATORS (CTS) WITH A NOMINAL GENERATING CAPACITY OF 270 MW CAPACITY EACH, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG) EQUIPPED WITH DUCT BURNERS, DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION (SCR), OXIDATION CATALYST	Carbon Dioxide Equivalent (CO2e)	EXCLUSIVE USE OF PIPELINE-QUALITY NATURAL GAS, AND INSTALLATION OF HIGH-EFFICIENCY CT MODEL (MITSUBISHI G MODEL)	946	LB/MW-H (AS CO2)	12-MONTH ROLLING
Pseg Fossil LLC Sewaren Generating Station	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - SIEMENS	15.21	Natural Gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two Siemens turbines and two associated duct burners) The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV).	Carbon Dioxide		925	LB/MW-H	CONSECUTIVE 12 MONTHS (ROLLING 1 MONTH)
Pseg Fossil LLC Sewaren Generating Station	PSEG FOSSIL LLC	NJ	Douglas Gordon	3/7/2014	This is a new 625 MW combined cycle project at an existing facility. The project will comprise of two combustion turbines, EITHER GE7FA.05 OR Siemens SGT6 5000F, with two duct burners, two Heat Recovery Steam Generators (HRSG), one steam turbine, one 250 HP fire pump and a 3-cell auxiliary cooling tower. Each turbine will be equipped with Selective Catalytic Reduction System (SCR) for control of NOx emissions and Oxidation Catalyst for control of CO and VOC. The heat input rate of the Siemens turbine will be 2,356 MMBtu/hr(HHV) with a 62.1 duct burner MMBtu/hr(HHV). The heat input rate of each GE turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 duct burner MMBtu/hr(HHV).	Facility-wide Greenhouse Gas (GHG) emissions increase as CO2e = +2,010,399 tpy	COMBINED CYCLE COMBUSTION TURBINE WITH DUCT BURNER - GENERAL ELECTRIC	15.21	Natural gas	33,691	MMCF/YR	Natural Gas Usage <= 33,691 MMft^3/yr per 365 consecutive day period, rolling one day basis (per two turbines and two duct burners) The heat input rate of each General Electric combustion each turbine will be 2,312 MMBtu/hr(HHV) with a 164.4 MMBtu/hr duct burner	Carbon Dioxide		925	LB/MW-H	CONSECUTIVE 12 MONTHS (ROLLING 1 MONTH)
Troutdale Energy Center, LLC	TROUTDALE ENERGY CENTER, LLC	OR	WILLARD LADD	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		Mitsubishi M501-GAC combustion turbine, combined cycle configuration with duct burner.	15.21	natural gas		MMBTU/H	or ULSD; Duct burner 499 MMBtu/hr, natural gas	Carbon Dioxide Equivalent (CO2e)	Thermal efficiency Clean fuels	1,000	PER GROSS MWH	365-DAY ROLLING AVERAGE
Troutdale Energy Center, LLC	TROUTDALE ENERGY CENTER, LLC	OR	Willard Ladd	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		Mitsubishi M501-GAC combustion turbine, combined cycle configuration with duct burner.	15.21	natural gas	2,988	MMBTU/H	or ULSD; Duct burner 499 MMBtu/hr, natural gas	Carbon Dioxide Equivalent (CO2e)	Thermal efficiency Clean fuels	1,000	PER GROSS MWH	365-DAY ROLLING AVERAGE

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Troutdale Energy Center, LLC	TROUTDALE ENERGY CENTER, LLC	OR	Willard Ladd	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		GE LMS-100 combustion turbines, simple cycle with water injection	15.21	natural gas	1,690	MMBTU/H		Carbon Dioxide Equivalent (CO2e)	Thermal efficiency Clean fuels	1,707	LB OF CO2 /GROSS MWH	365-DAY ROLLING AVERAGE
Duke Energy Carolinas LLC, W.S. Lee Steam Station		SC		2/19/2014			COMBINED CYCLE COMBUSTION TURBINES (GE)	15.21				THE FACILITY PLANS TO INSTALL EITHER TWO GE 7FA.05 OR TWO SIEMENS SGT-5000F(5) NATURAL GAS FIRED COMBUSTION TURBINE GENERATORS, EACH EQUIPPED WITH A DUCT-FIRED HEAT RECOVERY STEAM GENERATOR.	Carbon Dioxide	ENERGY EFFICIENT PROCESSES, PRACTICES, AND DESIGN	1,000	LB/MWH CO2	12-OPERATING MONTH ROLLING AVERAGE
Salem Harbor Station Redevelopment	FOOTPRINT POWER SALEM HARBOR DEVELOPMENT LP	MA	Scott Silverstein	1/30/2014	Footprint Power Salem Harbor Development LP (the Permittee) proposes to construct and operate a nominal 630 Megawatt (MW) natural gas fired, quick start (capable of producing 300 MW within 10 minutes of startup) combined cycle electric generating facility (the Facility) at Salem Harbor Station. With duct firing, the proposed Facility will be capable of generating an additional 62 MW, for a total of 692 MW. Emission units include two 315 MW (nominal) GE Model 107F Series 5 combustion turbine generators, each with dedicated heat recovery steam generator, duct burner and 31 MW (estimated) steam turbine generator, dispatchable independently of one another by ISO-NE; one 80 MMBtu/hr auxiliary boiler, one 750 kW emergency engine-generator, and one 371 bhp emergency engine-fire-pump.	separate PSD permit under delegated program, and CPA approval (including nonattainment major NSR for NOx as ozone precursor, and state minor NSR for other pollutants) other facility-wide emission limits (not listed in next section): GHG(CO2e): 2,279,530 TPY CO2: 2,277,333 TPY H2SO4: 19.0 TPY	Combustion Turbine with Duct Burner	15.21	Natural Gas	2,449	MMBTU/H	two 315 MW (nominal) GE Energy 7F Series 5 Rapid Response Combined Cycle Combustion Turbines with Duct Burners and 31 MW (estimated) steam turbine generators	Carbon Dioxide Equivalent (CO2e)		825	LB/MW-H	FULL LOAD WITHOUT DUCT FIRING
Berks Hollow Energy Assoc LLC/ Ontelaunee	BERKS HOLLOW ENERGY ASSOC LLC	PA	Bradley J Cooley	12/17/2013	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	Turbine, Combined Cycle, #1 and #2	15.21	Natural Gas	3,046	MMBTU/H	Equipped with SCR and Oxidation Catalyst	Carbon Dioxide		1,000	LB/MW-H	
Berks Hollow Energy Assoc LLC/ Ontelaunee	BERKS HOLLOW ENERGY ASSOC LLC	PA	Bradley J Cooley	12/17/2013	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	This application is for the construction of a natural gas-fired combined-cycle electric generation facility that is designed to generate up to 855 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output.	Turbine, Combined Cycle, #1 and #2	15.21	Natural Gas	3,046	MMBTU/H	Equipped with SCR and Oxidation Catalyst	Carbon Dioxide Equivalent (CO2e)		1,380,899	T/YR	
Holland Board Of Public Works - East 5Th Street	HOLLAND BOARD OF PUBLIC WORKS	MI	David Koster	12/4/2013	Natural gas combined heat and power plant.		FG-CTGHRSG: 2 Combined cycle CTGs with HRSGs with duct burners	15.21	natural gas	647	MMBTU/H for each CTGHRSG	This process is identified in the permit as FGCTGHRSG; it is 2 combined cycle natural gas-fired combustion turbine generators (CTGs) with Heat Recovery Steam Generators (HRSGs) equipped with duct burners for supplemental firing (EUCTGHRSG1 & EUCTGHRSG2 in FGCTGHRSG). The total hours for both units combined for startup and shutdown shall not exceed 635 hours per 12-month rolling time period. Each CTGHRSG shall not exceed 647 MMBtu/hr on a fuel heat input basis.	Carbon Dioxide Equivalent (CO2e)	Energy efficiency measures and the use of a low carbon fuel (pipeline quality natural gas).	339,125	T/YR	12-MO ROLL TIME PERIOD
Air Liquide, Bayou Cogeneration Plant	AIR LIQUIDE LARGE INDUSTRIES U.S., L.P.	TX	Aswath Kalappa	11/21/2013	The redevelopment project at the Bayou Cogeneration Plant consists of replacing components of the power block and the boilers at the existing facility.	The Texas Commission on Environmental Quality (TCEQ) reviewed and issued the associated permitting action for the non-GHG emissions. CN600300693; RN100233998	Combustion Turbine with HRSG and Duct Burners	15.21	Pipeline Nat Gas and 90/10 blend	11,988	Btu/kWhr (HHV, gross)	Does not include a steam cycle condensing turbine and is not a combined cycle plant. Fuel is limited to pipeline quality natural gas or a max of 90/10 ratio of pipeline quality natural gas blended with off-gas based on an annual average. CO2 CEMS and Fuel Flow Meter are required. Stack sampling is required for CO2 using 40 CFR 60.8 and Method 3a or 3b and calculation for CH4, N2O and CO2e.	Carbon Dioxide Equivalent (CO2e)		7,720	BTU/KWH (HHV, GROSS)	365-DAY ROLLING AVERAGE INCLUDES MSS

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Renaissance Power LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG1-4 Natural gas fueled combined cycle combustion turbine generators (CTG)	15.21	Natural gas	2,147	MMBTU/H	FG-CTG1-4: Four natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. Two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner, a selective catalytic reduction (SCR) system, and a catalytic oxidation system. The throughput capacity is 2,147 MMBtu/hr for each CTG. The turbines are existing simple cycle turbines that will be retrofit to be combined cycle units.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices/energy efficiency	1,000	LB/MW-H	12-MONTH ROLLING AVERAGE
Renaissance Power LLC	LS POWER DEVELOPMENT LLC	MI	Bradley Cooley	11/1/2013	For technical questions regarding this permit, please contact the permit engineer, Melissa Byrnes, at 517-284-6790. Thank you.	Other facility-wide pollutants not listed below (tpy): PM10=211.19+ PM2.5=205.24+ Lead=0.0027+ CO2e=5,398,441+ Sulfuric Acid Mist=5.67+	FG-CTG/DB1-4 Natural gas fueled combined cycle combustion turbine generators; duct burner on HRSG	15.21	Natural gas	2,807	MMBTU/H	Four natural gas-fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSGs) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system, and a catalytic oxidation system. Additionally, the HRSG is operated with a natural gas fired duct burner during supplemental firing. The turbines are existing simple cycle turbines which will be retrofit to be combined cycle. Operational restriction is 4000 hrs/year that each DB can operate.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices/energy efficiency	1,000	LB/MW-H	12-MONTH ROLLING AVERAGE
Morgan City Power Plant	LOUISIANA ENERGY AND POWER AUTHORITY (LEPA)	LA		9/26/2013			Combustion Turbine with SCR/HRSG	15.21	Natural Gas	607	MMBTU/hr		Carbon Dioxide	Thermally efficient combustion turbine and good combustion practices.			
Thetford Generating Station	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FGCCA or FGCCB--4 nat. gas fired CTG w/ DB for HRSG	15.21	natural gas	2,587	MMBTU/H heat input, each CTG	Natural gas fired CTG with DB for HRSG; 4 total. Technology A (4 total) is 2587 MMBTU/H design heat input each CTG. Technology B (4 total) is 2688 MMBTU/H design heat input each CTG. Permit was issued for either of two F Class turbine technologies with slight variations in emission rates. Applicant will select one technology. Installation is two separate CTG/HRSG trains driving one steam turbine electrical generator; Two 2X1 Blocks. Each CTG will be rated at 211 to 230 MW (gross) output and the station nominal generating capacity will be up to 1,400 MW.	Carbon Dioxide Equivalent (CO2e)	No info was entered on type of add-on control. Contact permitting agency.	1,386,286	T/YR	12-MO ROLL TIME PERIOD DETER EACH MONTH
Mooreland Generating Sta	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFEC's system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are considered grandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	Combustion Turbine	15.21	Natural Gas	360	MW	This process represents the GE option for the project - One GE 7FA.05 natural gas-fired combustion turbine generator with an 820.5 MMBTUH duct burner.	Carbon Dioxide Equivalent (CO2e)	EFFICIENT DESIGN AND COMBUSTION.	1,000	LB/MW-HR	ANNUAL
Mooreland Generating Sta	WESTERN FARMERS ELECTRIC COOPERATIVE	OK	Gerald Butcher	7/2/2013	WFEC operates the Mooreland Generating Station to generate wholesale electricity which is transmitted over WFEC's system. The facility was originally constructed in 1963. The electricity is sold in rural areas of approximately 3/4 of the state of Oklahoma and part of New Mexico. The Mooreland Generating Station currently consists of three high-pressure boilers that burn locally-produced natural gas. The three high-pressure boilers used to generate electricity and the auxiliary boiler used to heat the facility were constructed before May 31, 1972, and are considered grandfathered from construction permitting requirements.	WFEC submitted a Prevention of Significant Deterioration (PSD) construction permit application for the proposed addition of a combined-cycle combustion turbine and associated support equipment to the existing Mooreland Generating Station	COMBUSTION TURBINE	15.21	NATURAL GAS	360	MW	This process represents the Siemens option for the project - One Siemens SGT6-5000F5 natural gas-fired combustion turbine generator with an 820.3 MMBTUH duct burner.	Carbon Dioxide Equivalent (CO2e)	EFFICIENT DESIGN AND COMBUSTION.	1,000	LB/MW-HR	ANNUAL
Oregon Clean Energy Center	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, without duct burners	15.21	Natural Gas	515,600	MMSCF/rolling 12-months	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Carbon Dioxide Equivalent (CO2e)	state-of-the-art high efficiency combustion technology	318,404	LB/H	
Oregon Clean Energy Center	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Siemens, with duct burners	15.21	Natural Gas	51,560	MMSCF/rolling 12-MO	Two Siemens 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Carbon Dioxide Equivalent (CO2e)	state-of-the-art high efficiency combustion technology	318,404	LB/H	

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Oregon Clean Energy Center	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, without duct burners	15.21	Natural Gas	47,917	MMSCF/rolling 12-MO	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process without duct burners.	Carbon Dioxide Equivalent (CO2e)	state-of-the-art high efficiency combustion technology	318,404	LB/H	
Oregon Clean Energy Center	ARCADIS, US, INC.	OH	Lynn Gresock	6/18/2013	799 Megawatt Combined Cycle Combustion Turbine Power Plant	The permit is set up to install either 2 Mitsubishi M501 GAC units or 2 Siemens SGT-8000H units, not both; with dedicated heat recovery steam generators (HRSG), steam turbine generator, and electric generator.	2 Combined Cycle Combustion Turbines-Mitsubishi, with duct burners	15.21	Natural Gas	47,917	MMSCF/rolling 12-MO	Two Mitsubishi 2932 MMBtu/H combined cycle combustion turbines , both with 300 MMBtu/H duct burners, with dry low NOx combustors, SCR, and catalytic oxidizer. Will install either 2 Siemens or 2Mitsubishi, not both (not determined). Short term limits are different with and without duct burners. This process with duct burners.	Carbon Dioxide Equivalent (CO2e)	state-of-the-art high efficiency combustion technology	318,404	LB/H	
Midland Cogeneration Venture	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG	15.21	Natural gas	2,237	MMBTU/H	Throughput is 2,237 MMBTU/H for each CTG Equipment is permitted as following flexible group (FG): FG-CTG1-2: Two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices and energy efficiency.	995	LB/MW-H	12-MO. ROLLING AVERAGE
Midland Cogeneration Venture	MIDLAND COGENERATION VENTURE	MI	Brian Vokal	4/23/2013	Electricity and steam generation	Facility wide increase of other pollutants not listed below: PM10 = +174.0 TPY PM2.5 = +174.0 TPY Lead = +0.0214 TPY CO2e = +2,545,965.0 TPY Sulfuric Acid Mist = +0.77 TPY	Natural gas fueled combined cycle combustion turbine generators (CTG) with HRSG and duct burner (DB)	15.21	Natural gas	2,486	MMBTU/H	This process is permitted in a flexible group format, identified in the permit as FG-CTG/DB1-2 and is for two natural gas fired CTGs with each turbine containing a heat recovery steam generator (HRSG) to operate in combined cycle. The two CTGs (with HRSG) are connected to one steam turbine generator. Each CTG is equipped with a dry low NOx (DLN) burner and a selective catalytic reduction (SCR) system. Additionally, the HRSG is operating with a natural gas fired duct burner for supplemental firing. The throughput is 2,486 MMBTU/H for each CTG/DB.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices and energy efficiency	1,071	LB/MW-H	12-MONTH ROLLING AVG.
Hickory Run Energy Station	HICKORY RUN ENERGY LLC	PA	David Wilson	4/23/2013	Natural gas-fired combined-cycle electric generation facility that is designed to generate up to 900 MW nominal, using 2 combustion turbine generators and 2 heat recovery steam generators that will provide steam to drive a single steam turbine generator. Each heat recovery steam generator will be equipped with a duct burner which may be utilized at time of peak power demands to supplement power output. The project will also include a natural gasfired auxiliary boiler; a diesel engine-driven emergency generator; a diesel engine-driven firewater pump; a multi-cell evaporative cooling tower; and associated emission control systems, tanks, and other balance of plant equipment.		COMBINED CYCLE UNITS #1 and #2	15.21	Natural Gas	3	MMCF/HR	The Permittee shall select and install any of the turbine options listed below (or newer versions of these turbines if the Department determines that such newer versions achieve equivalent or better emissions rates and exhaust parameters) 1. General Electric 7FA (GE 7FA) 2. Siemens SGT6-5000F (Siemens F) 3. Mitsubishi M501G (Mitsubishi G) 4. Siemens SGT6-8000H (Siemens H) The emissions listed are for the Siemens SGT6-8000H unit.	Carbon Dioxide Equivalent (CO2e)		3,665,974	TPY	12-MONTH ROLLING TOTAL FOR BOTH UNITS
Sunbury Generation Lp/Sunbury Ses	SUNBURY GENERATION LP	PA	Mark Crawford	4/1/2013	This plan approval is for the repowering of the Sunbury Generation facility. This project will be for the construction of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners. The project will also be for the construction of a natural gas fired auxiliary boiler to assist with startup and shutdown activities and a small natural gas fired dew point heater. As part of the project all of the facility's existing coal fired utility boilers will be permanently retired.		Combined Cycle Combustion Turbine AND DUCT BURNER (3)	15.21	Natural Gas	2,538,000	MMBTU/H	Three powerblocks consisting of three (3) natural gas fired F class combustion turbines coupled with three (3) heat recovery steam generators (HSRGs) equipped with natural gas fired duct burners.	Carbon Dioxide Equivalent (CO2e)		281,727	LB/H	WHEN DUCT BURNERS OPERATING
Brunswick County Power Station	VIRGINIA ELECTRIC AND POWER COMPANY	VA	Jeffrey Zehner	3/12/2013	New, combined-cycle, natural gas-fired, electrical power generating facility.		COMBUSTION TURBINE GENERATORS, (3)	15.21	Natural Gas	3,442	MMBTU/H	Three (3) Mitsubishi M501 GAC combustion turbine generators with HRSG duct burners (natural gas-fired).	Carbon Dioxide Equivalent (CO2e)	Energy efficient combustion practices and low GHG fuels.	7,500	BTU/KW-H	
Garrison Energy Center	GARRISON ENERGY CENTER, LLC/ CALPINE CORPORATION	DE	Stuart Widom	1/30/2013	one (1) 309 MW GE Combined Cycle Combustion Turbine Generating system fired principally on Natural Gas, one (1) 86,000 GPM Cooling Tower, one (1) 1,400,000 ULSD Storage Tank		Unit 1	15.21	Natural Gas	2,260	million BTUs		Carbon Dioxide Equivalent (CO2e)	Fuel Usage Restriction to natural gas and low sulfur distillate fuel	1,006,304	TONS	12 MONTH ROLLING AVERAGE

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
St. Joseph Energy Center, LLC	ST. JOSEPH ENERGY CENTER, LLC	IN	Mr. Willard Ladd	12/3/2012	STATIONARY ELECTRIC UTILITY GENERATING STATION		FOUR (4) NATURAL GAS COMBINED CYCLE COMBUSTION TURBINES	15.21	NATURAL GAS	2,300	MMBTU/H	EACH TURBINE IS EQUIPPED WITH DRY LOW NOX BURNERS, NATURAL GAS FIRED DUCT BURNERS, AND A HEAT RECOVERY STEAM GENERATOR IDENTIFIED AS HRSG#. NOX EMISSIONS CONTROLLED BY SELECTIVE CATALYTIC REDUCTION SYSTEMS (SCR##) ALONG WITH CO AND VOC EMISSSIONS CONTROLLED BY OXIDATION CATAYLST SYSTEMS (CAT##) IN EACH TURBINE. EACH STACK HAS CONTINUOUS EMISSIONS MONITORS FOR NOX AND CO. COMBINED NOMIAL POWER OUTPUT IS 1.350 MW.	Carbon Dioxide Equivalent (CO2e)	HIGH THERMAL EFFICIENCY DESIGN	7,646	BTU/KW-H	
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/HRSG5(FD 3-Series)	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 50 l F Combustion Turbine Generator (CTGS) rated at a maximum base-load electric output of approximately 180 MW and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Carbon Dioxide		1,062,627	T/YR	365-DAY ROLLING AVERAGE
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/ HRSG5 (FD2- Series)	15.21	natural gas			Natural Gas-Fired Siemen FD3-Series 50 l F Combustion Turbine Generator (CTGS) rated at a maximum base-load electric output of approximately 180 M W and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Carbon Dioxide		0.460	T/MW-H	30-DAY ROLLING AVERAGE
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 2-Series) -Initial Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD2-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 168 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Nitrous Oxide (N2O)		1.82	T/YR	365-DAY ROLLING AVERAGE
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 2-Series) -Initial Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD2-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 168 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Carbon Dioxide		984,393	T/YR	365-DAY ROLLING AVERAGE

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 3-Series) -Final Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 180 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Carbon Dioxide		10,020,391	T/YR	365-DAY ROLLING AVERAGE
Hess Newark Energy Center	HESS NEWARK ENERGY CENTER, LLC	NJ	Peter Haid	11/1/2012	Combined Cycle Electric Generating Facility HESS Newark Energy Center (Hess-NEC), proposed at City of Newark (Essex County), New Jersey, would be a new, highly efficient, 655 MW combined-cycle power generating facility. Hess-NEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,320 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, a 12-cell mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Facility-wide Greenhouse Gas (GHG) emissions as CO2e emissions = 2,003,654 tpy	Combined cycle turbine with duct burner	15.21	natural gas	39,463	mmcubic ft/year*	* Annual throughput is for 2 turbines, 2 duct burners and 1 auxiliary boiler	Carbon Dioxide Equivalent (CO2e)	Good Combustion Practices	887	LB/MW-H	CONSCUTV 12 MONTH PERIOD ROLLING 1 MONTH
Nrg Energy Center Dover	NRG ENERGY CENTER DOVER LLC	DE	William Grow	10/31/2012	The facility operates two electric generation units and an auxiliary steam boiler.		UNIT 2- KD1	15.21	Natural Gas	655	MMBTU/H	500 MMBTU/hr Gas Turbine (Model: GE LM6000) rated at 52 MW and 155 MMBTU/hr Heat Recovery Steam Generator rated at 18 MW. The unit is required to operate a certified CEMS and COMS.	Carbon Dioxide Equivalent (CO2e)		1,085	LB/GROSS MWH	12 MONTH ROLLING AVERAGE
Moxie Liberty LLC/Asylum Power Pl T	MOXIE ENERGY LLC	PA	Kent J Morton	10/10/2012		The project consists of two identical 1 x 1 power blocks, and each block includes a combustion gas turbine and a steam turbine. Each combined-cycle process will also include a heat recovery steam generator and supplemental duct burners. Additionally, one diesel-fired emergency generator, one diesel fired fire water pump, two diesel fuel storage tanks, two lube oil storage tanks, and one aqueous ammonia storage tank were proposed to be constructed and operated. Each combined-cycle process will be rated at 468 MW or less.	Combined-cycle Turbines (2) - Natural gas fired	15.21	Natural Gas	3,277	MMBTU/H	Two combine cycle Turbines, each with a combustion turbine and heat recovery steam generator with duct burner. Each combined-cycle process will be rated at 468 MW or less. The heat input rating of each combustion gas turbine is 2890 MMBtu/hr (HHV) or less, and the heat input rating of each supplemental duct burner is equal to 387 MMBtu/hr (HHV) or less.	Carbon Dioxide Equivalent (CO2e)	Good combustion practices.	1,480,086	T/YR	468 MW POWERBLOCK
Gateway Cogeneration 1, LLC - Smart Water Project	GATEWAY GREEN ENERGY	VA	T. Edward Mcdaniel	8/27/2012	Combined cycle electrical power generating facility (160 MW), consisting of two combustion turbines (Rolls Royce Trent 60 WLE) with associated HRSG and no duct burning.		COMBUSTION TURBINES, (2)	15.21	Natural Gas	593	MMBTU/H	Burns primarily natural gas but has the capacity to burn up to 500 hours of ultra low sulfur diesel fuel (ULSD) as backup.	Carbon Dioxide Equivalent (CO2e)	Controlled by the use of low carbon fuels and high efficiency design. The heat rate shall be no greater than 8,983 Btu/kW-h (HHV, gross).	295,961	T/YR	12 MO ROLLING AVG

Table C-5. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Woodbridge Energy Center	CPV SHORE, LLC	NJ	Mark Turner	7/25/2012	Woodbridge Energy Center (WEC), proposed at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, would be a new, highly efficient, 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) with a heat input rate of 2,307 MMBtu/hr, that will utilize pipeline natural gas only. Heat recovery steam generators (HRSGs) downstream of the combustion turbines will recover heat from the exhaust gases to generate steam. The HRSGs will be equipped with natural gas-fired duct burners for supplementary firing and will share a single steam turbine generator (STG). Supporting ancillary equipment includes a natural gas fired auxiliary boiler, one small dew point fuel gas heater (fuel gas heater), a mechanical draft cooling tower, an emergency diesel generator and an emergency diesel fire pump.	Other Permitting Information: Facility-Wide Greenhouse Gas (GHG) emissions as CO2e emissions= 2,073,645 tons per year	Combined Cycle Combustion Turbine with Duct Burner	15.21	Natural gas	40,298	mmcubic ft/year	Woodbridge Energy Center (WEC), located at Riverside Drive in Woodbridge Township (Middlesex County), New Jersey, 07095, will be a new 700 MW combined-cycle power generating facility. WEC will consist of two General Electric (GE) combustion turbine generators (CTGs) each with a maximum rated heat input of 2,307 million British thermal units per hour (MMBtu/hr), that will utilize pipeline natural gas only, with 2 HRSGs, 2 Duct Burners (each 500 MMBtu/hr).	Carbon Dioxide Equivalent (CO2e)	Good combustion practices	925	LB/MW-H	BASED ON 12 MONTH PERIOD, ROLLING 1 MNTH
Sabine Pass Lng Terminal	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	PATRICIA OUTTRIM	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Combined Cycle Refrigeration Compressor Turbines (8)	15.21	natural gas	286	MMBTU/H	GE LM2500+G4	Carbon Dioxide Equivalent (CO2e)	Good combustion/operating practices and fueled by natural gas - use GE LM2500+G4 turbines	4,872,107	TONS/YEAR	ANNUAL MAXIMUM FROM THE FACILITYWIDE
Cogeneration Plant	WESTLAKE VINYLS COMPANY LP	LA	Karen Khonsari	12/6/2011	COGENERATION PLANT AT SYNTHETIC ORGANIC CHEMICAL MANUFACTURING FACILITY	APPLICATION ACCEPTED RECEIVED DATE = DATE OF ADMINISTRATIVE COMPLETENESS FWE REPRESENT POTENTIAL EMISSIONS ASSOCIATED WITH THE COGENERATION PLANT. NOX NETTED OUT OF PSD/NNSR.	COGENERATION TRAINS 1-3 (1-10, 2-10, 3-10)	15.21	NATURAL GAS	475	MMBTU/H	EACH COGEN TRAIN CONSISTS OF A 50 MW GE LM6000 PF SPRINT TURBINE AND A HEAT RECOVERY STEAM GENERATOR EQUIPPED WITH A 70 MM BTU/HR DUCT BURNER.	Carbon Dioxide Equivalent (CO2e)	USE OF NATURAL GAS AS FUEL AND GOOD COMBUSTION PRACTICES	55,577	LB/H	HOURLY MAXIMUM
Sumpter Power Plant	WOLVERINE POWER SUPPLY COOPERATIVE INC.	MI	Brian Warner	11/17/2011	Utility--Natural gas fired combustion turbine	Other Facility Wide Pollutants not listed below: PM10 = 14.8 tpy PM2.5 = 14.8 tpy CO2e = 232,639 tpy	Combined cycle combustion turbine w/ HRSG	15.21	Natural gas	130	MW electrical output	This is a combined-cycle combustion turbine with a non-fired heat recovery steam generator (HRSG). Natural gas-fired combustion turbine conversion to combined-cycle.	Carbon Dioxide Equivalent (CO2e)		954	LB/MW-H	12-MONTH ROLLING AVERAGE
Thomas C. Ferguson Power Plant	LOWER COLORADO RIVER AUTHORITY	TX	Kenneth Taylor	11/10/2011	Install 2 new natural gas-fired combined-cycle combustion turbine units (U1-STKand U2-STK) with a generating capacity of approximately 590 MW. The steam produced from the two new combustion turbines will exhaust to two dedicated Heat Recovery Steam Generators (HRSG) to produce steam. The steam produced from the two HRSGs is routed to the new shared steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid.		COMBINED CYCLE TURBINE GENERATOR U1-STK	15.21	Natural Gas	1,746	MMBTU/H	Natural gas-fired GE 7FA combustion turbine unit, U1-STK. and is rated at Max. based-load output of 195 MW and vented to a Heat Recovery Steam Generator(HRSG) that is equipped with a SCR and an Oxidation Catalyst(OC).	Carbon Dioxide Equivalent (CO2e)	Good Combustion Practices	908,958	LB/H	30-DAY ROLLING AVERAGE
Thomas C. Ferguson Power Plant	LOWER COLORADO RIVER AUTHORITY	TX	Kenneth Taylor	11/10/2011	Install 2 new natural gas-fired combined-cycle combustion turbine units (U1-STKand U2-STK) with a generating capacity of approximately 590 MW. The steam produced from the two new combustion turbines will exhaust to two dedicated Heat Recovery Steam Generators (HRSG) to produce steam. The steam produced from the two HRSGs is routed to the new shared steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid.		COMBINED CYCLE TURBINE GENERATOR U1-STK	15.21	Natural Gas	1,746	MMBTU/H	Natural gas-fired GE 7FA combustion turbine unit, U1-STK. and is rated at Max. based-load output of 195 MW and vented to a Heat Recovery Steam Generator(HRSG) that is equipped with a SCR and an Oxidation Catalyst(OC).	Nitrous Oxide (N2O)		1.70	T/YR	360 DAY ROLLING AVERAGE
Palmdale Hybrid Power Project	CITY OF PALMDALE	CA	Steve Williams	10/18/2011	570 MW NATURAL GAS FIRED COMBINED CYCLE POWER PLANT WITH AN INTEGRATED 50 MW SOLAR THERMAL PLANT	NOTE: FINAL PSD PERMIT ISSUED ON 11/18/2011. PERMIT APPEALED TO THE ENVIRONMENTAL APPEALS BOARD, AND EAB DENIED REVIEW OF THIS APPEAL ON 9/17/2012. PETITIONER FILED A PETITION FOR REVIEW WITH THE 9TH CIRCUIT FEDERAL COURT. THIS COURT CASE WAS DISMISSED ON 10/28/2013.	COMBUSTION TURBINES (NORMAL OPERATION)	15.21	NATURAL GAS	154	MW	TWO NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 154 MEGAWATT (MW, GROSS) EACH, TWO HEAT RECOVERY STEAM GENERATORS (HRSG), ONE STEAM TURBINE GENERATOR (STG) RATED AT 267 MW, AND 251 ACRES OF PARABOLIC SOLAR-THERMAL COLLECTORS WITH ASSOCIATED HEAT-TRANSFER EQUIPMENT	Carbon Dioxide Equivalent (CO2e)		774	LB/MW-H	365-DAY ROLLING AVG (FACILITYWIDE)

Table C-6. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - Methane Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Colorado Bend Energy Center	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Methane	efficient processes, practices, and designs	37.0	TPY	
Morgan City Power Plant	LOUISIANA ENERGY AND POWER AUTHORITY (LEPA)	LA		9/26/2013			Combustion Turbine with SCR/HRSG	15.21	Natural Gas	607	MMBTU/hr		Methane	Good combustion practices			
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/HRSG5(FD 3-Series)	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 50 I F Combustion Turbine Generator (CTGS) rated at a maximum base-load electric output of approximately 180 MW and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Methane		19.7	T/YR	365-DAY ROLLING AVERAGE
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/ HRSG5 (FD2- Series)	15.21	natural gas			Natural Gas-Fired Siemen FD2-Seri es 501F Combustion Turbine Generator (CTG5) rated at a maximum base-load electric ou tput of approximately 1 68 MW and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Methane		19.3	T/YR	365-DAY ROLLING AVERAGE
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 2-Series) -Initial Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD2-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 168 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Methane		18.2	T/YR	365-DAY ROLLING AVERAGE

Table C-6. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - Methane Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 3-Series) -Final Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 180 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Methane		18.6	T/YR	365-DAY ROLLING AVERAGE
Thomas C. Ferguson Power Plant	LOWER COLORADO RIVER AUTHORITY	TX	Kenneth Taylor	11/10/2011	Install 2 new natural gas-fired combined-cycle combustion turbine units (U1-STKand U2-STK) with a generating capacity of approximately 590 MW. The steam produced from the two new combustion turbines will exhaust to two dedicated Heat Recovery Steam Generators (HRSG) to produce steam. The steam produced from the two HRSGs is routed to the new shared steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid.		COMBINED CYCLE TURBINE GENERATOR U1-STK	15.21	Natural Gas	1,746	MMBTU/H	Natural gas-fired GE 7FA combustion turbine unit, U1-STK. and is rated at Max. based-load output of 195 MW and vented to a Heat Recovery Steam Generator(HRSG) that is equipped with a SCR and an Oxidation Catalyst(OC).	Methane		16.8	T/YR	365-DAY ROLLING AVERAGE

Table C-7. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - Nitrous Oxides (N_2O) Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Colorado Bend Energy Center	COLORADO BEND II POWER, LLC	TX	Al Hatton	4/1/2015	Combined cycle combustion turbine electric generating facility. These will be the first two General Electric (GE) Model 7HA.02 Combustion Turbines in a combined cycle power plant that uses two combustion turbines and one steam turbine using air-cooled condensers and controlled with Selective catalytic reduction (SCR) and oxidation catalyst.		Combined-cycle gas turbine electric generating facility	15.21	natural gas	1,100	MW	combined cycle power plant that uses two combustion turbines and one steam turbine, model GE 7HA.02	Nitrous Oxide (N2O)	efficient processes, practices, and designs			
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/HRSG5(FD 3-Series)	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 50 I F Combustion Turbine Generator (CTGS) rated at a maximum base-load electric output of approximately 1 80 M W and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Nitrous Oxide (N2O)		1.97	T/YR	365-DAY ROLLING AVERAGE
Deer Park Energy Center LLC	CALPIINE CO - DEER PARK ENERGY CENTER(DPEC) LLC	TX	Parick Blanchard	11/29/2012	DPEC plant proposes phased construction of the natural gas-fired combined-cycle CTG with a generating capacity of approximately 180 megawatts that will be completed in two stages of construction. In the initial phase - Calpine intends to construct a Siemens Model FD2 combustion turbine. In the second Phase - Siemens Model FD2 combustion turbine will be upgraded in performance as a FD3-series combustion turbine.		CTG5/ HRSG5 (FD2- Series)	15.21	natural gas			Natural Gas-Fired Siemen FD3-Series 50 I F Combustion Turbine Generator (CTGS) rated at a maximum base-load electric output of approximately 168 MW and venting to a dedicated Heat Recovery Steam Generator (HRSGS) that is equipped with a Selective Catalytic Reduction (SCR).	Nitrous Oxide (N2O)		1.93	T/YR	365-DAY ROLLING AVERAGE
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 2-Series) -Initial Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD2-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 168 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Nitrous Oxide (N2O)		1.82	T/YR	365-DAY ROLLING AVERAGE

Table C-7. RBLC Search Results for Large Natural Gas Combustion Turbines (Combined Cycle) - Nitrous Oxides (N_2O) Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility description	Permit notes	Process Name	Process Type	Primary Fuel	Throughput	Throughput Unit	Process notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Channel Energy Energy Center, LLC	CALPINE CORPORATION-CHANNEL ENERGY CENTER, LLC	TX	Patrick Blanchard	11/29/2012	The permittee is a natural gas-fired combined-cycle electric generating unit at the Channel Energy Center (CEC) LLC power plant in Harris County, Texas. With this permit, the Permittee will construct a new natural gas-fired combined-cycle combustion turbine generator (CTG) unit, identified as CTG3/HRSG3, with a generating capacity of approximately 180 MW. Construction will be completed in two phases: in phase one, a new 168 MW Siemens FD2-series turbine will be constructed; in the second phase, the FD2 turbine which will be modified and upgraded to the 180 MW FD3-series within the prescribed time lines as defined by this permit. The steam produced from the new combustion turbine will exhaust to a dedicated Heat Recovery Steam Generator (HRSG) to produce steam. The steam produced from the HRSG is routed to either the existing steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid or may be sold for use at an adjacent industrial facility.		CTG3/HRSG3(FD 3-Series) -Final Phase	15.21	Natural Gas			Natural Gas-Fired Siemen FD3-Series 501 F Combustion Turbine Generator (CTG3) rated at a maximum base-load electric output of approximately 180 MW and venting to a dedicated Heat Recovery Steam Generator (HRSG3) that is equipped with a Selective Catalytic Reduction (SCR).	Nitrous Oxide (N2O)		1.86	T/YR	365-DAY ROLLING AVERAGE
Thomas C. Ferguson Power Plant	LOWER COLORADO RIVER AUTHORITY	TX	Kenneth Taylor	11/10/2011	Install 2 new natural gas-fired combined-cycle combustion turbine units (U1-STKand U2-STK) with a generating capacity of approximately 590 MW. The steam produced from the two new combustion turbines will exhaust to two dedicated Heat Recovery Steam Generators (HRSG) to produce steam. The steam produced from the two HRSGs is routed to the new shared steam turbine unit to produce electricity for sale to the Electric Reliability Council of Texas (ERCOT) power grid.		COMBINED CYCLE TURBINE GENERATOR U1-STK	15.21	Natural Gas	1,746	MMBTU/H	Natural gas-fired GE 7FA combustion turbine unit, U1-STK. and is rated at Max. based-load output of 195 MW and vented to a Heat Recovery Steam Generator(HRSG) that is equipped with a SCR and an Oxidation Catalyst(OC).	Nitrous Oxide (N2O)		1.70	T/YR	360 DAY ROLLING AVERAGE

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Washington Parish Energy Center	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	SETH BEREND	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 SUSD - Simple-Cycle Combustion Turbine 1 (Startup/Shutdown/ Maintenance/Tuning /Runback) [EQT0019]	15.11	Natural Gas	MM BTU/hr	Limited to 600 hr/yr	Carbon Dioxide Equivalent (CO2e)	Facility-wide energy efficiency measures , such as improved combustion measures, and use of pipeline quality natural gas.	120	LB/MM BTU	ANNUAL AVERAGE
Washington Parish Energy Center	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	SETH BEREND	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 SUSD - Simple-Cycle Combustion Turbine 2 (Startup/ Shutdown/ Maintenance/ Tuning/Runback) [EQT0020]	15.11	Natural Gas	MM BTU/hr	limited to 600 hr/yr	Carbon Dioxide Equivalent (CO2e)	Facility-wide energy efficiency measures , such as improved combustion measures, and use of pipeline quality natural gas.	120	LB/MM BTU	ANNUAL AVERAGE
Washington Parish Energy Center	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	SETH BEREND	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG01 NO - Simple-Cycle Combustion Turbine 1 (Normal Operations) [EQT0017]	15.11	Natural Gas	MM BTU/hr	Normal operations are based on 7000 hrs/yr	Carbon Dioxide Equivalent (CO2e)	Facility-wide energy efficiency measures , such as improved combustion measures, and use of pipeline quality natural gas.	50	KG/GJ	ANNUAL AVERAGE
Washington Parish Energy Center	WASHINGTON PARISH ENERGY CENTER ONE, LLC	LA	SETH BEREND	5/23/2018	New 414 MW electric generating plant which provides electricity during peak demand. It consists of two simple-cycle turbine generators which fire natural gas only.	Application Accepted Date reflects date of administrative completeness.	CTG02 NO - Simple-Cycle Combustion Turbine 2 (Normal Operations) [EQT0018]	15.11	Natural Gas	MM BTU/hr	Normal operations are based on 7000 hours per year	Carbon Dioxide Equivalent (CO2e)	Facility-wide energy efficiency measures , such as improved combustion measures, and use of pipeline quality natural gas.	50	KG/GJ	ANNUAL AVERAGE
Waverly Power Plant	PLEASANTS ENERGY LLC	WV	GERALD GATTI	3/13/2018	300 MW Simple-Cycle Peaking Plant	Modification to existing PSD Permit (R14-0034, RBLC Number WV-0027) to add ‘‘advanced gas path‘‘ technology to the turbines that was defined as a ‘‘change in the method of operation‘‘ that resulted a major modification to the turbines.	GE 7FA.004 Turbine	15.11	Natural Gas	MW	This one entry is for both turbines as they are the same. Each turbine, after this modification, is a nominal 167.8 MW GE Model 7FA.004. Has oil-fire backup.	Carbon Dioxide Equivalent (CO2e)	Use of natural gas & use of GE 7FA.004		
Mustang Station	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	JEFF PIPPIN	8/16/2017	GE7FA combustion turbine (Unit 6) to increase the hours of operation to 3000 hours per year. The turbine construction was completed the first quarter of 2013 and initial firing began on April 1, 2013.		Simple Cycle Turbine	15.11	NATURAL GAS	MW	Unit 6 Turbine is limited to 3000 hours per year.	Carbon Dioxide Equivalent (CO2e)	Pipeline quality natural gas and good combustion practices	120	LB/MMBTU	
Jackson County Generating Facility	SOUTHERN POWER	TX	KELLI MCCULLOUGH	6/30/2017	simple cycle electric generation		Simple Cycle Turbines	15.11	natural gas	MW	The facility will consist of four Siemens F5 model (~230 megawatts (MW) each for a total of 920 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year.	Carbon Dioxide Equivalent (CO2e)	energy efficiency designs, practices, and procedures, CT inlet air cooling, periodic CT burner maintenance and tuning, reduction in heat loss, i.e., insulation of the CT, instrumentation and controls	1,316	LB/MW HR	
Gaines County Power Plant	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	David Low	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (NOx) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Carbon Dioxide Equivalent (CO2e)	Pipeline quality natural gas; limited hours; good combustion practices	1,300	LB/MW H	

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Gaines County Power Plant	SOUTHWESTERN PUBLIC SERVICE COMPANY	TX	DAVID LOW	4/28/2017	constructed in phases, with natural gas-fired simple cycle combustion turbines (SCCTs) with dry low nitrogen oxide (N0x) burners (DLN) to be converted into 2-on-1 combined cycle combustion turbines (CCCTs) with selective catalytic reduction (SCRs), heat recovery steam generators (HRSGs, one per combustion turbine) and one steam turbine per two CCCTs. Federal control review only applies to the turbines and HRSGs.		Simple Cycle Turbine	15.11	natural gas	MW	Four Siemens SGT6-5000F5 natural gas fired combustion turbines	Carbon Dioxide Equivalent (CO2e)	Pipeline quality natural gas; limited hours; good combustion practices	1,300	LB/MW H	
Cameron Lng Facility	CAMERON LNG LLC	LA	CLAYTON MILLER	2/17/2017	a facility to liquefy natural gas for export (5 trains)	Permit PSD-LA-766, dated 10/1/13 for liquefaction trains 1,2, and 3 Permit PSD-LA-766(M1), dated 6/26/14, for minor changes; Permit PSD-LA-766(M2), dated 3/3/16, for train 4 and 5	Gas turbines (9 units)	15.11	natural gas	mm btu/hr		Carbon Dioxide Equivalent (CO2e)	good combustion practices and fueled by natural gas; Use high thermal efficiency turbines			
Corpus Christi Liquefaction	CORPUS CHRISTI LIQUEFACTION STAGE III, LLC	TX	KEITH LITTLE	2/14/2017	Trains 4 and 5 will consist of 12 natural gas compressor turbines, 2 thermal oxidizers, 2 sets of flares each comprised of one wet gas flare and one dry gas flare, 2 amine surge tanks (maintenance, startup, and shutdown [MSS] only), 3 diesel generators, 3 fire-water pump diesel engines, 6 fixed roof diesel storage tanks, and piping components.		Refrigeration compressor turbines	15.11	NATURAL GAS	HP	2 liquefied natural gas trains consisting of a total of (12) GE LM2500+ DLE turbines drive the propane, ethylene, and methane section compressors.	Carbon Dioxide Equivalent (CO2e)		1,793,574	T/YR	
Waverly Facility	PLEASANTS ENERGY, LLC	WV	GERALD GATTI	1/23/2017	300 MW, natural gas fired, simple cycle peaking power facility	In this permitting action PSD only applies to the modified combustion turbines based on the relaxation of an original synthetic minor permit issued in 1999. Project also involves previous installation of turbo-charging. All BACT emission limits are given without turbocharging and startup/shutdown emissions are not included. Please contact above engineer for more information. There are two identical turbines but only one is listed.	GE Model 7FA Turbine	15.11	Natural Gas	MMBtu/hr	There are two identical units at the facility.	Carbon Dioxide	Use of Natural Gas, Selection of GE7FA	1,300	LB/MW-HR	NATURAL GAS
Montpelier Generating Station	AES OHIO GENERATION, LLC	IN	DREW PARKER	1/6/2017	COMBUSTION TURBINES		PRATT TWIN-PAC SIMPLE CYCLE TURBINES	15.11	NATURAL GAS	MMBTU/H	NO. 2 DIESEL OIL BACKUP FUEL	Carbon Dioxide	NATURAL GAS AS PRIMARY FUEL; GOOD COMBUSTION PRACTICES	118	LB/MMBTU	FOR NATURAL GAS

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Invenergy Nelson Expansion LLC	INVENERGY	IL	GORDON GRAY	9/27/2016	Peaking facility at an existing major source. The expansion will consist of two simple cycle combustion turbines and a fuel heater.		Two Simple Cycle Combustion Turbines	15.11	Natural Gas	MW	Two simple cycle combustion turbines used for peaking purposes and fired primarily on natural gas with ULSD as a secondary fuel.	Carbon Dioxide Equivalent (CO2e)	Turbine-generator design and proper operation			
Greenidge Station	GREENIDGE GENERATION LLC	NY		9/7/2016	Greenidge Generation LLC has submitted a revised application for a Title V Air Permit in accordance with the requirements of Title 6 of the New York compilation of Codes, Rules, and Regulations, Part 201-6 (6 NYCRR Part 201-6). The application is for conversion of the Greenidge Electricity Generating Station, located in the Town of Torrey, Yates County to operate primarily on natural gas with up to 19% biomass co-firing. Greenidge Station is comprised of Unit 4, which includes a Combustion Engineering, tangentially-fired dry bottom boiler (Boiler No. 6) with a maximum heat input rating of 1,117 MMBtu/hr, and a steam generating turbine with a maximum rated output of 107 Megawatts (MW) of electricity. The facility is equipped with a suite of air pollution control (both pre-combustion and post-combustion) systems to control pollutant nitrogen oxides, carbon monoxide, and particulate matter (PM, PM10 and PM2.5) emissions from facility operations. Greenhouse gases will be reduced substantially primarily by the use of cleaner fuels. Under the proposal, Unit 4 will not burn coal or fuel oil any longer.	Also NAICS 221117 - biomass with wood	Turbine - natural gas	15.11	natural gas	MW		Carbon Dioxide		130	LB/MMBTU	1 H
Hill County Generating Facility	BRAZOS ELECTRIC COOPERATIVE	TX	MIKE MEYERS	4/7/2016	Four simple cycle combustion turbine electric generators are proposed. Natural gas or ultra-low sulfur diesel fuel oil are the fuels. Turbine model options are: General Electric (GE) 7FA.03, GE 7FA.04, GE 7FA.05, and Siemens SGT6-5000(5)ee. Electric output is between 684 and 928 megawatts (MW).		Simple cycle turbine	15.11	natural gas	MW	Each combustion turbine is limited to 2,920 hours of annual operation, including startup and shutdown hours.	Carbon Dioxide Equivalent (CO2e)		1,434	LB/MWH	
Neches Station	APEX TEXAS POWER LLC	TX	David Jenkins	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines 25 MW	15.11	natural gas	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Carbon Dioxide Equivalent (CO2e)	good combustion practices	1,341	LB/MW H	
Neches Station	APEX TEXAS POWER LLC	TX	DAVID JENKINS	3/24/2016	either 4 simple cycle combustion turbine generators (CTGs) or two CTGs operating in simple cycle or combined cycle modes. The CTGs will be one of two options: Siemens or General Electric.		Large Combustion Turbines 25 MW	15.11	natural gas	MW	4 Simple cycle CTGs, 2,500 hr/yr operational limitation. Facility will consist of either 232 MW (Siemens) or 220 MW (GE)	Carbon Dioxide Equivalent (CO2e)	good combustion practices	1,341	LB/MW H	
Magnolia Lng Facility	MAGNOLIA LNG, LLC	LA	KOMI HASSAN	3/21/2016	A new facility to liquefy 8.0 million metric tons per year of natural gas		Gas Turbines (8 units)	15.11	natural gas	mm btu/hr		Carbon Dioxide Equivalent (CO2e)	good combustion/operating /maintenance practices and fueled by natural gas; use intake air chiller			
Nacogdoches Power Electric Generating Plant	NACOGDOCHES POWER	TX	KELLI MCCULLOUGH	3/1/2016	Electric Generation		Simple Cycle	15.11	natural gas	MW		Carbon Dioxide Equivalent (CO2e)	Good Combustion Practices	1,316	LB/MW HR	
Port Arthur Lng Export Terminal	PORT ARTHUR LNG, LLC	TX	J.D. Morris	2/17/2016	Liquefied natural gas (LNG) export terminal		Simple Cycle Electrical Generation Gas Turbines 15.210	15.11	natural gas	MW	Nine GE PGT25+G4 gas turbines for electrical generation at the site at 34 MW/turbine	Carbon Dioxide Equivalent (CO2e)	Equipment specifications & work practices - Good combustion practices and use of low carbon, low sulfur fuel	156,912	T/YR	

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Van Alstyne Energy Center	NAVASOTA NORTH PEAKERS OPERATING COMPANY I, LLC.	TX	BILL SKINNER	1/13/2016	Navasota North Peakers Operating Company I, LLC. proposes to install three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 megawatt (MW) each; manufacturer™s output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	mw	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Carbon Dioxide		1,461	LB/MWH	
Union Valley Energy Center	NAVASOTA SOUTH PEAKERS OPERATING COMPANY II, LLC.	TX	BILL SKINNER	12/16/2015	three new natural gas fired combustion turbine generators (CTGs). The CTGs will be the General Electric 7FA.04 (~214 megawatt (MW) each; manufacturer™s output at baseload, ISO at 183 MW), operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Carbon Dioxide Equivalent (CO2e)		1,461	LB/MW H	
Clear Springs Energy Center (Csec)	NAVASOTA SOUTH PEAKERS OPERATING COMPANY II, LLC.	TX	BILL SKINNER	11/13/2015	Navasota South Peakers Operating Company II LLC proposes to install three new natural gas fired combustion turbine generators (CTGs). Each CTG will be a General Electric 7FA.04 model that can produce approximately 183 Megawatts (MW) each based upon the manufacturer™s projected output at baseload operating as peaking units in simple cycle.		Simple Cycle Turbine	15.11	natural gas	MW	The CTGs will be three General Electric 7FA.04 (~183 MW each for a total of 550 MW), operating as peaking units in simple cycle mode. Each turbine will be limited to 2,500 hours of operation per year. The new CTGs will use dry low-NOx (DLN) burners and may employ evaporative cooling for power enhancement.	Carbon Dioxide Equivalent (CO2e)	Low carbon fuel, good combustion, efficient combined cycle design	1,461	LB/MW H	
Shawnee Energy Center	SHAWNEE ENERGY CENTER, LLC	TX	NEIL O'DONOVAN	11/10/2015	Electric Generating Utility: The project will consist of four gas fired combustion turbines (CTGs). The CTGs are fueled with pipeline quality natural gas and will operate in simple cycle mode. The gas turbines will be one of two options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	MW	Siemens Model SGT6-5000 F5ee â“ 230 MW or Second turbine option: General Electric Model 7FA.05TP â“ 227 MW	Carbon Dioxide Equivalent (CO2e)		1,398	LB/MWH	
Cedar Bayou Electric Generating Station	NRG TEXAS POWER	TX	Craig Eckbert	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	MW	4 turbine options General Electric 7HA “ 359 MW GE 7FA “ 215 MW Siemens SF5 (SF5) “ 225 MW Mitsubishi 501G (MHI510G) “ 263 MW	Carbon Dioxide		1,232	LB CO2/MWH	
Sr Bertron Electric Generating Station	NRG TEXAS POWER	TX	Craig Eckbert	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Simple cycle turbines greater than 25 megawatts (MW) firing natural gas	15.11	natural gas	MW	4 options: General Electric (GE) 7HA 359 MW GE 7FA “ 215 MW Siemens SF5 (SF5) “ 225 MW Mitsubishi 501G (MHI510G) “ 263 MW	Carbon Dioxide		1,232	LB /MW H	

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Sr Bertron Electric Generating Station	NRG TEXAS POWER	TX	CRAIG ECKBERT	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Simple cycle turbines greater than 25 megawatts (MW) firing natural gas	15.11	natural gas	MW	4 options: General Electric (GE) 7HA 359 MW GE 7FA â“ 215 MW Siemens SF5 (SF5) â“ 225 MW Mitsubishi 501G (MHI510G) â“ 263 MW	Carbon Dioxide		1,232	LB /MW H	
Cedar Bayou Electric Generating Station	NRG TEXAS POWER	TX	CRAIG ECKBERT	9/15/2015	Electric Generating Utility: The project will consist of two gas fired combustion turbines (CTGs) each equipped with a supplementary fired [duct burners (DBs)] heat recovery steam generator (HRSG). The CTGs and DBs are fueled with pipeline quality natural gas. The CTGs will operate in simple cycle and combined cycle modes. The gas turbines will be one of four options.		Simple cycle turbines greater than 25 megawatts (MW)	15.11	natural gas	MW	4 turbine options General Electric 7HA â“ 359 MW GE 7FA â“ 215 MW Siemens SF5 (SF5) â“ 225 MW Mitsubishi 501G (MHI510G) â“ 263 MW	Carbon Dioxide		1,232	LB CO2/MWH	
Fort Myers Plant	FLORIDA POWER & LIGHT (FPL)	FL	JOHN HAMPP	9/10/2015	Electric power plant, consists of a 6-on-2 combined-cycle unit (Units 2A through 2F) and two modern simple-cycle combustion turbines. Primary fuel is natural gas. Also includes 12 gas turbines (63 MW each) for peaking, introduced into service in 1974. This project entails decommissioning 10 of the 12 peaking turbines. They will be replaced with two new GE 7F.05 turbines, each with nominal capacity of 200 MW	Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0710002.022.AC.D.Z IP	Combustion Turbines	15.11	Natural gas	MMBtu/hr gas	Two GE 7F.05 turbines, approximately 200 MW each. Natural-gas is primary fuel. Permitted 3390 hr/yr of operation, of which no more than 500 hr may be on fuel oil. Dry Low-NOx, with wet injection for oil firing.	Carbon Dioxide Equivalent (CO2e)	Use of low-emitting fuel and efficient turbine	1,374	LB CO2E / MWH	FOR NATURAL GAS OPERATION
Lauderdale Plant	FLORIDA POWER & LIGHT	FL	JOHN HAMPP	8/25/2015	Large natural gas- and oil-fired power facility, consisting of four combined cycle units, and many combustion turbines. Small peaking units being replaced with larger combustion turbines.	Re-affirmed BACT determinations in Permit No. 0110037-011-AC. Also, new GHG BACT determination. Technical evaluation available at https://arm-permit2k.dep.state.fl.us/nontv/0110037.013.AC.D.Z IP	Five 200-MW combustion turbines	15.11	Natural gas	MMBtu/hr (approx)	Five simple cycle GE 7F.05 turbines. Max of 3390 hours per year per turbine. Of the 3390 hours per year, up to 500 hour may be on ULSD fuel oil.	Carbon Dioxide	Use of natural gas with restricted use of ULSD as backup fuel	1,372	LB/MWH	NAT GAS OPERATION, 12-OR 36- MO ROLLING
Antelope Elk Energy Center	GOLDEN SPREAD ELECTRIC COOPERATIVE, INC.	TX	JOLLY HAYDEN	5/20/2015	Golden Spread Electric Cooperative, Inc. (GSEC) is requesting authorization for three additional simple cycle electric generating plants at an existing site to meet increased energy demand in the area. The generating equipment consists of three new GE 7F5-Series natural gas-fired combustion turbines (CTG). Each turbine has a maximum electric output of 202 MW.		Simple Cycle Turbine Generator	15.11	natural gas	MW	3 additional GE 7F 5-Series Combustion Turbine Generators	Carbon Dioxide Equivalent (CO2e)	Energy efficiency, good design & combustion practices	1,304	LB CO2/MWHR	
Sabic Innovative Plastics Mt. Vernon, Lc	SABIC INNOVATIVE PLASTICS MT. VERNON, LC	IN	GREGORY MICHAEL	12/11/2014	PLASTIC MANUFACTURING PLANT		COMBUSTION TURBINE: COGEN	15.11	NATURAL GAS	MMBTU/H		Carbon Dioxide Equivalent (CO2e)		937,379	T/YR	

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Guadalupe Generating Station	GUADALUPE POWER PARTNERS, L.P.	TX	BILL SKINNER	12/2/2014	GPP proposes to add two (2) new gas-fired simple-cycle combustion turbines of 227 MW (nominal) electric generating capacity each to the 1,000 MW (nominal) existing major stationary source, Guadalupe Generating Station (GGS), located in Marion, Texas. The proposed project will provide peaking capacity at an existing natural gas fired combined cycle electric generating station. The two new natural gas-fired simple-cycle turbines are proposed to provide a fast ramp up for additional peaking capacity during peak electricity demand periods. In addition, the project also includes the installation of a firewater pump engine, circuit breakers and associated fugitive emissions.	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project. See CN600132120 and RN100225820	Simple Cycle Combustion Turbine Generator	15.11	Pipeline Natural Gas	Btu/kWh	Natural gas-fired simple cycle combustion turbine generators (CTG) will be General Electric 7FA.05 (GE 7FA.05), each with a maximum base-load electric power output of 227 megawatts (MW, nominal). Combined gross heat rate limit of 10,279,456 MMBtu/yr.	Carbon Dioxide Equivalent (CO2e)		1,293	LB CO2/MWHR (GROSS)	12-MONTH ROLLING AVERAGE (NORMAL OPER)
Guadalupe Generating Station	GUADALUPE POWER PARTNERS, L.P.	TX	BILL SKINNER	12/2/2014	GPP proposes to add two (2) new gas-fired simple-cycle combustion turbines of 227 MW (nominal) electric generating capacity each to the 1,000 MW (nominal) existing major stationary source, Guadalupe Generating Station (GGS), located in Marion, Texas. The proposed project will provide peaking capacity at an existing natural gas fired combined cycle electric generating station. The two new natural gas-fired simple-cycle turbines are proposed to provide a fast ramp up for additional peaking capacity during peak electricity demand periods. In addition, the project also includes the installation of a firewater pump engine, circuit breakers and associated fugitive emissions.	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project. See CN600132120 and RN100225820	Simple Cycle Combustion Turbine Generator	15.11	Pipeline Natural Gas	Btu/kWh	Natural gas-fired simple cycle combustion turbine generators (CTG) will be General Electric 7FA.05 (GE 7FA.05), each with a maximum base-load electric power output of 227 megawatts (MW, nominal). Combined gross heat rate limit of 10,279,456 MMBtu/yr.	Carbon Dioxide Equivalent (CO2e)		1,293	LB CO2/MWHR (GROSS)	12-MONTH ROLLING AVERAGE (NORMAL OPER)
Ector County Energy Center	INVENERGY THERMAL DEVELOPMENT LLC	TX	MATTHEW THORNTON	8/1/2014	Invenergy proposes to construct a 330 MW peak power plant (known as the Ector County Energy Center Plant (ECEC)), located in Goldsmith, Ector County, Texas. With this proposed project, Invenergy plans to construct two natural gas-fired simple-cycle turbines, General Electric (GE) Model 7FA.03, and associated equipment, a fire water pump engine, a natural gas-fired dew-point heater, and two circuit breakers. For the purposes of this proposed permitting action, GHG emissions are permitted for the two turbines, the fire water pump engine, the natural gas-fired dew-point heater, and the circuit breakers, as well as for fugitive emissions, and maintenance, startup and shutdown emissions.	Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project.	Simple Cycle Combustion Turbine, GE 7FA.03	15.11	Natural Gas	Btu/kWh (HHV)		Carbon Dioxide Equivalent (CO2e)		1,393	LB CO2/MWHR (GROSS)	2500 OPERATIONAL HR ROLLING DAILY/CT
Ector County Energy Center	INVENERGY THERMAL DEVELOPMENT LLC	TX	MATTHEW THORNTON	8/1/2014	Invenergy proposes to construct a 330 MW peak power plant (known as the Ector County Energy Center Plant (ECEC)), located in Goldsmith, Ector County, Texas. With this proposed project, Invenergy plans to construct two natural gas-fired simple-cycle turbines, General Electric (GE) Model 7FA.03, and associated equipment, a fire water pump engine, a natural gas-fired dew-point heater, and two circuit breakers. For the purposes of this proposed permitting action, GHG emissions are permitted for the two turbines, the fire water pump engine, the natural gas-fired dew-point heater, and the circuit breakers, as well as for fugitive emissions, and maintenance, startup and shutdown emissions.	Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project.	Simple Cycle Combustion Turbine-MSS	15.11	Natural Gas			Carbon Dioxide Equivalent (CO2e)		21	TON CO2E/EVENT	EACH MSS EVENT

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Perryman Generating Station	CONSTELLATION POWER SOURCE GENERATION, INC.	MD	BILL LEEDY	7/1/2014	120 MEGAWATT SIMPLE CYCLE NATURAL GAS FIRED POWER PLANTPERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	PERRYMAN 6 PROJECT-WIDE EMISSION LIMITS: PM10 = 43.0 TONS/YR PM2.5 = 43.0 TONS/YR NOX = 58.5 TONS/YR CO2E = 430,210 TONS/YR	(2) 60-MW SIMPLE CYCLE COMBUSTION TURBINES, FIRING NATURAL GAS	15.11	NATURAL GAS	MW	(2) 60-MEGAWATT PRATT & WHITNEY GAS TURBINE GENERATOR PACKAGE	Carbon Dioxide Equivalent (CO2e)	USE OF NATURAL GAS. ENERGY EFFICIENCY DESIGN - USE OF INLET FOGGING/WET COMPRESSION, INSULATION BLANKETS TO REDUCE HEAT LOSS, AND FUEL GAS PREHEATING.	1,394	LB CO2E/MWH	12-MONTH ROLLING, EXCLUDING SU/SD
Cove Point Lng Terminal	DOMINION COVE POINT LNG, LP	MD	RICHARD B. GANGLE	6/9/2014	LIQUIFIED NATURAL GAS PROCESSING FACILITY AND 130 MEGAWATT GENERATING STATIONFACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	FACILITY-WIDE PM10 EMISSION LIMIT = 124.2 TONS/YR FACILITY-WIDE PM2.5 EMISSION LIMIT= 124/2 TONS/YR FACILITY-WIDE CO2E EMISSION LIMIT = 2,030,988 TONS/YR FACILITY-WIDE FORMALDEHYDE EMISION LIMIT = 6.2 TONS/YR	2 COMBUSTION TURBINES	15.11	NATURAL GAS	MW	TWO GENERAL ELECTRIC (GE) FRAME 7EA COMBUSTION TURBINES (CTS) WITH A NOMINAL NET 87.2 MEGAWATT (MW) RATED CAPACITY, COUPLED WITH A HEAT RECOVERY STEAM GENERATOR (HRSG), EQUIPPED WITH DRY LOW-NOX COMBUSTORS, SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR), AND OXIDATION CATALYST	Carbon Dioxide Equivalent (CO2e)	HIGH EFFICIENCY GE 7EA CTS WITH HRSGS EQUIPPED WITH DLN1 COMBUSTORS AND EXCLUSIVE USE OF FACILITY PROCESS FUEL GAS OR PIPELINE QUALITY NATURAL GAS	117	LB/MMBTU	3-HOUR BLOCK AVERAGE
Midwest Fertilizer Corporation	MIDWEST FERTILIZER CORPORATION	IN	MICHAEL CHORLTON	6/4/2014	A STATIONARY NITROGEN FERTILIZER MANUFACTURING FACILITY		TWO (2) NATURAL GAS FIRED COMBUSTION TURBINES	15.11	NATURAL GAS	MMBTU/H, EACH	NATURAL GAS FIRED, OPEN-SIMPLE CYCLE COMBUSTION TURBINES WITH HEAT RECOVERY	Carbon Dioxide	GOOD COMBUSTION PRACTICES AND PROPER DESIGN	12,666	BTU/KW-H, MINIMUM	CONTINUOUS
Pueblo Airport Generating Station	BLACK HILLS ELECTRIC GENERATION, LLC	CO	MARK LUX	5/30/2014	Power generation facility		Turbine - simple cycle gas	15.11	natural gas	MMBTU/H	One (1) General Electric, simple cycle, gas turbine electric generator, Unit 6 (CT08), model: LM6000, SN: N/A, rated at 375 MMBtu per hour.	Carbon Dioxide Equivalent (CO2e)	Good Combustion Control	1,600	LB/MW H GROSS	ROLLING 365-DAY AVE
Indeck Wharton Energy Center	INDECK WHARTON, LLC	TX	JAMES SCHNEIDER	5/12/2014	Indeck proposes to construct a peaking power plant, the Indeck Wharton Energy Center, generally located south of Danevang, Texas. To meet the anticipated demand for peak power, Indeck proposes to construct three identical natural gas-fired F-class simple cycle combustion turbines with associated support equipment. Indeck proposes that the three new combustion turbine generators (CTGs) will be either General Electric (GE) 7FA.05 or Siemens SGT6-5000F(5). The GE 7FA.05 has a base-load electric power output of approximately 213 megawatts (MW, net nominal), and the Siemens SGT6-5000F(5) has a base-load electric power output of approximately 225 MW (net nominal). This project also proposes to install one emergency diesel generator, one diesel fire water pump, one natural gas pipeline heater, and other auxiliary equipment.	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project.	Simple Cycle Combustion Turbine, GE 7FA.05	15.11	Pipeline Natural Gas		Indeck proposes to construct three identical natural gas-fired F-class simple cycle combustion turbines with associated support equipment. Indeck proposes that the three new combustion turbine generators (CTGs) will be either General Electric (GE) 7FA.05 or Siemens SGT6-5000F(5). The GE 7FA.05 has a base-load electric power output of approximately 213 megawatts (MW, net nominal), and the Siemens SGT6-5000F(5) has a base-load electric power output of approximately 225 MW (net nominal).	Carbon Dioxide Equivalent (CO2e)		1,276	LB CO2/MWHR (GROSS)	2,500 OPERATIONAL HR ROLLING DAILY/CT

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
Indeck Wharton Energy Center	INDECK WHARTON, LLC	TX	JAMES SCHNEIDER	5/12/2014	Indeck proposes to construct a peaking power plant, the Indeck Wharton Energy Center, generally located south of Danevang, Texas. To meet the anticipated demand for peak power, Indeck proposes to construct three identical natural gas-fired F-class simple cycle combustion turbines with associated support equipment. Indeck proposes that the three new combustion turbine generators (CTGs) will be either General Electric (GE) 7FA.05 or Siemens SGT6-5000F(5). The GE 7FA.05 has a base-load electric power output of approximately 213 megawatts (MW, net nominal), and the Siemens SGT6-5000F(5) has a base-load electric power output of approximately 225 MW (net nominal). This project also proposes to install one emergency diesel generator, one diesel fire water pump, one natural gas pipeline heater, and other auxiliary equipment.	The Texas Commission on Environmental Quality is the permitting authority for the non-GHG emissions associated with this project.	Simple Cycle Combustion Turbine, SGT-5000F(5)	15.11	Pipeline Natural Gas		Indeck proposes to construct three identical natural gas-fired F-class simple cycle combustion turbines with associated support equipment. Indeck proposes that the three new combustion turbine generators (CTGs) will be either General Electric (GE) 7FA.05 or Siemens SGT6-5000F(5). The GE 7FA.05 has a base-load electric power output of approximately 213 megawatts (MW, net nominal), and the Siemens SGT6-5000F(5) has a base-load electric power output of approximately 225 MW (net nominal).	Carbon Dioxide Equivalent (CO2e)		1,337	LB CO2/MWHR (GROSS)	2500 OPERATIONAL HR ROLLING DAILY/CT
Troutdale Energy Center, LLC	TROUTDALE ENERGY CENTER, LLC	OR	WILLARD LADD	3/5/2014	Troutdale Energy Center (TEC) proposes to construct and operate a 653 megawatt (MW) electric generating plant in Troutdale, Oregon. TEC proposes to generate electricity with three natural gas-fired turbines, one of which will be a combined-cycle unit with duct burner and heat recovery steam generator.		GE LMS-100 combustion turbines, simple cycle with water injection	15.11	natural gas	MMBTU/H		Carbon Dioxide Equivalent (CO2e)	Thermal efficiency Clean fuels	1,707	LB OF CO2 /GROSS MWH	365-DAY ROLLING AVERAGE
Lonesome Creek Generating Station	BASIN ELECTRIC POWER COOP.	ND	JERRY MENGE	9/16/2013	Three natural gas fired simple cycle turbines used to generate electricity for peak power demand. The turbines are GE LM6000 PF Sprint units with a nominal capacity of 45 MW each.		Natural Gas Fired Simple Cycle Turbines	15.11	Natural gas	MMBTU/H	The heat input is for a single unit.	Carbon Dioxide Equivalent (CO2e)	High efficiency turbines	220,122	TONS	12 MONTH ROLLING TOTAL
Thetford Generating Station	CONSUMERS ENERGY COMPANY	MI	James Walker	7/25/2013	Four (4) natural gas fired combined cycle combustion turbine generators (CTG) and heat recovery steam generators (HRSG) with duct burner firing capability; ancillary facility equipment.	Existing substation property to be used for new construction of this generating station--4 CTG/HRSG. Additional equipment included in the permit: 315 hp diesel RICE fire pump engine; two natural gas auxiliary boilers < 100 MMBtu/hr; two natural gas fired fuel heaters; two peaker units (natural gas fired simple cycle combustion turbine driving an electrical generator--CTG).	FG-PEAKERS: 2 natural gas fired simple cycle combustion turbines	15.11	natural gas	MMBTU/H	Two natural gas fired simple cycle combustion turbines each with an electrical generator (nominal 13MW each; 171 MMBtu/hr heat input rating each). Each turbine is limited to 343 MMscf of natural gas per 12-month rolling time period as determined at the end of each calendar month. Both turbines combined are limited to 5.15 MMscf of natural gas each calendar day.	Carbon Dioxide Equivalent (CO2e)	Efficient combustion; energy efficiency	20,141	T/YR	12-MO ROLLING TIME PERIOD
Edgewood Energy LLC	EDGEWOOD ENERGY LLC	NY		7/9/2013	Edgewood Energy LLC is a power is a simple cycle combustion turbine plant located in Edgewood, Suffolk County, New York that contains two GE LM6000 combustion turbines that fire only natural gas. The facility has an optimum electrical output of 95 megawatts (MW) firing only natural gas. This electrical output represents an increase from the 79.9 MW limit. This increase was allowed through a declaratory ruling that the Department of Public Service issued. The facility is subject to PSD for greenhouse gases (GHGs) and PM-10 emissions. The facility is not subject to non-attainment NSR for any non-attainment contaminant.		Turbines - NG	15.11	natural gas			Carbon Dioxide		1,300	LB/MWH	
Pioneer Generating Station	BASIN ELECTRIC POWER COOPERATIVE	ND	JERRY MENGE	5/14/2013	Three GE LM6000 PC SPRINT natural gas fired turbines used to generate electricity for peak periods.	The permit was for the addition of 2 turbines to the station. Since a synthetic minor limit was relaxed for the first unit, BACT was required for all three turbines.	Natural gas-fired turbines	15.11	Natural gas	MMBTU/H	Rating is for each turbine.	Carbon Dioxide Equivalent (CO2e)		243,147	T/12 MON ROLL TOTAL	12 MONTH ROLLING TOTAL/EACH UNIT

Table C-8. RBLC Search Results for Large Natural Gas Combustion Turbines (Simple Cycle) - CO_2 Emission Limit

Facility Name	Corporate Or Company Name	Facility State	Facility Contact Name	Permit Issuance Date	Facility Description	Permit Notes	Process Name	Process Type	Primary Fuel	Throughput Unit	Process Notes	Pollutant	Control Method Description	Emission Limit 1	Emission Limit 1 Unit	Emission Limit 1 Average Time Condition
R.M. Heskett Station	MONTANA-DAKOTA UTILITIES CO.	ND	ABBIE KREBSBACH	2/22/2013	Addition of a natural gas-fired turbine (Unit 3) to an existing coal-fired power plant. The turbine will be used for supplying peak power and is rated at 986 MMBtu/hr and 88 MWe at average site conditions.		Combustion Turbine	15.11	Natural gas	MMBTU/H	Turbine is a GE Model PG 7121 (7EA) used as a peaking unit.	Carbon Dioxide Equivalent (CO2e)		413,198	TONS/12 MONTH	12 MONTH ROLLING TOTAL
Pio Pico Energy Center	PIO PICO ENERGY CENTER, LLC	CA	GARY CHANDLER	11/19/2012	CONSTRUCTION OF THREE GENERAL ELECTRIC (GE) LMS100 NATURAL GAS-FIRED COMBUSTION TURBINE-GENERATORS (CTGS) RATED AT 100 MW EACH. THE PROJECT WILL HAVE AN ELECTRICAL OUTPUT OF 300 MW.	NOTE: PERMIT ISSUED 11/19/2012. ENVIRONMENTAL APPEALS BOARD REMANDED THE PM BACT ANALYSIS TO REGION 9 ON 8/2/2013. FINAL PERMIT ISSUED ON 2/28/2014. ONE PETITION FILED IN 9TH CIRCUIT FEDERAL COURT CHALLENGING THE FINAL PERMIT DECISION. THIS LAWSUIT WAS DISMISSED ON 6/17/2014 IN RESPONSE TO PETITIONERS MOTION FOR VOLUNTARY DISMISSAL.	COMBUSTION TURBINES (NORMAL OPERATION)	15.11	NATURAL GAS	MW	Three simple cycle combustion turbine generators (CTG). Each CTG rated at 100 MW (nominal net).	Carbon Dioxide Equivalent (CO2e)		1,328	LB/MW-H	GROSS OUTPUT
Sabine Pass Lng Terminal	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL	LA	PATRICIA OUTTRIM	12/6/2011	A liquefaction section of the terminal which will include 24 compressor turbines, two generator turbines, two generator engines, flares, acid gas vents, and fugitives		Simple Cycle Generation Turbines (2)	15.11	Natural Gas	MMBTU/H	GE LM2500+G4	Carbon Dioxide Equivalent (CO2e)	Good combustion/operating practices and fueled by natural gas - use GE LM2500+G4 turbines	4,872,107	TONS/YR	ANNUAL MAXIMUM FROM THE FACILITYWIDE

APPENDIX D: SIP PERMIT APPLICATION FORMS

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

EXPEDITED PERMITTING PROGRAM – APPLICATION FOR ENTRY TO PROGRAM FOR AIR PERMITS

EPD Use Only

Date Received: _____ Application No. _____

To be eligible for expedited review, this application form must be accompanied by the complete permit application for the type of air permit being requested, and a pre-application meeting with EPD must have been conducted.

1. Contact Information

Facility Name: Thomas A. Smith Energy Facility
AIRS No. (if known): 04-13-213 -00034
Contact Person: Courtney Adcock Title: Sr. Environmental Specialist
Telephone No.: 770-270-7678 Alternate Phone No.: _____
Email Address: courtney.adcock@opc.com

If EPD is unable to contact me, please contact the alternate contact person:
Contact Person: Justin Fickas Title: Managing Consultant
Telephone No.: 404-751-0228 Alternate Phone No.: _____
Email Address: jfickas@trinityconsultants.com

On Page 2 of this form, please check the appropriate box for which type of air permit you are requesting expedited review.

I have read the Expedited Review Program Standard Operating Procedures and accept all of the terms and conditions within. I understand that it is my responsibility to ensure an application of the highest quality is submitted and to address any requests for additional information by the deadline specified. I understand that submittal of this request form is not a guarantee that expedited review will be granted.

Signature: _____ Date: _____

2. Applying For Which Type Of Permit: (Please Check Appropriate Box)

Expedited Review Fees for Air Permits	
Permit Type – Please Check One	**Expedited Review Fee***
☐ Generic Permit: Concrete Batch Plant – Minor Source	$1,000
☐ Generic Permit: Concrete Batch Plant – Synthetic Minor Source	$1,500
☐ Generic Permit: Hot Mix Asphalt Plant – Synthetic Minor Source	$2,000
☐ Minor Source Permit (or Amendment)	$3,000
☐ Synthetic Minor Permit (or Amendment)	$4,000
☐ Major Source SIP Permit not subject to PSD or 112(g)	$6,000
☐ Title V 502(b)(10) Permit Amendment	$4,000
☐ Title V Minor Modification with Construction	$4,000
☐ Title V Significant Modification	$6,000
☐ Major Source SIP Permit subject to 112(g) but not subject to PSD	$15,000
☐ PSD Permit (or Amendment) not subject to NAAQS and/or PSD Increment Modeling	$15,000
☐ PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling but not subject to Modeling for $PM_{2.5}$, NO_2, or SO_2	$20,000
■ PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling for $PM_{2.5}$, NO_2, or SO_2	$25,000
☐ PSD Permit (or Amendment) subject to NAAQS and/or PSD Increment Modeling for $PM_{2.5}$, NO_2, or SO_2 and also impacting a Class I Area	$30,000
* Do not send fee payment with this form. Upon acceptance of application for the expedited permit program, EPD will notify you by phone. Fees must be paid via check to "Georgia Department of Natural Resources" within five (5) business days of acceptance.	

3. Comments.

This section is optional. Applicants may use this field to include specific comments or requests for EPD consideration. For example, the applicant may use this field to request a public hearing or to remind EPD of review time needs and/or expectations that may differ from the time frames in the procedures.

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

SIP AIR PERMIT APPLICATION

EPD Use Only

Date Received: _____ Application No. _____

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Thomas A. Smith Energy Facility
AIRS No. (if known): 04-13- 213 - 00034
Facility Location: Street: 925 Loopers Bridge Road
City: Dalton Georgia Zip: 30721 County: Murray
Is this facility a "small business" as defined in the instructions? Yes: ☐ No: ☒

2. Facility Coordinates

Latitude: 34° 42' 33" **NORTH** Longitude: 84° 55' 7" **WEST**
UTM Coordinates: 690615 **EAST** 3842764 **NORTH** **ZONE** 16

3. Facility Owner

Name of Owner: Oglethorpe Power Corporation
Owner Address Street: 2100 East Exchange Place
City: Tucker State: GA Zip: 30084

4. Permitting Contact and Mailing Address

Contact Person: Courtney Adcock Title: Sr. Environmental Specialist
Telephone No.: (770) 270-7678 Ext. _____ Fax No.: (770) 270-7920
Email Address: courtney.adcock@opc.com
Mailing Address: Same as: Facility Location: ☐ Owner Address: ☒ Other: ☐
If Other: Street Address: _____
City: _____ State: _____ Zip: _____

5. Authorized Official

Name: James Messersmith Title: Sr. Vice President, Plant Operations
Address of Official Street: 2100 East Exchange Place
City: Tucker State: GA Zip: 30084

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: _____ Date: _____

6. Reason for Application: (Check all that apply)

☐ New Facility (to be constructed)

☒ Existing Facility (initial or modification application)

☒ Permit to Construct

☒ Permit to Operate

☐ Change of Location

☒ Permit to Modify Existing Equipment: Affected Permit No.: 4911-213-0034-V-08-0

☐ Revision of Data Submitted in an Earlier Application

Application No.: _____

Date of Original Submittal: _____

7. Permitting Exemption Activities (for permitted facilities only):

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☒ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. Has assistance been provided to you for any part of this application?

☐ **No** ☐ **Yes, SBAP** ☒ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: Trinity Consultants

Name of Contact: Justin Fickas

Telephone No.: 404-751-0228 Fax No.: 678-441-9978

Email Address: jfickas@trinityconsultants.com

Mailing Address: Street: 3495 Piedmont Road Building 10, Suite 905

City: Atlanta State: GA Zip: 30305

Describe the Consultant's Involvement:

Preparation of application.

9. Submitted Application Forms: Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
1	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
	2.06 Manufacturing and Operational Data
1	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
1	4.00 Emissions Data
1	5.00 Monitoring Information
	6.00 Fugitive Emission Sources
1	7.00 Air Modeling Information

10. Construction or Modification Date

Estimated Start Date: December 1, 2019

11. If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"?

☐ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)		
Nitrogen oxides (NOx)		
Particulate Matter (PM) (filterable only)		
PM <10 microns (PM10)		
PM <2.5 microns (PM2.5)		
Sulfur dioxide (SO_2)		
Volatile Organic Compounds (VOC)		
Greenhouse Gases (GHGs) (in CO2e)		
Total Hazardous Air Pollutants (HAPs)		
Individual HAPs Listed Below:		

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	> 250	304.05	1,269	597.80
Nitrogen oxides (NOx)	> 250	146.20	575	309.30
Particulate Matter (PM) (filterable only)	> 250	86.00	345	269.01
PM <10 microns (PM10)	> 250	86.00	345	269.01
PM <2.5 microns (PM2.5)	> 250	86.00	344	269.01
Sulfur dioxide (SO_2)	100 to 250	8.10	61.1	25.62
Volatile Organic Compounds (VOC)	> 250	20.20	191	63.20
Greenhouse Gases (GHGs) (in CO2e)	> 75,000	1,636,005	5,103,253	5,080,359
Total Hazardous Air Pollutants (HAPs)	< 25	< 25	19.1	< 19.1
Individual HAPs Listed Below:				
Maximum Single HAP	< 10	< 10	5.82	< 5.82

14. 4-Digit Facility Identification Code:

SIC Code: 4911 SIC Description: Electric Services

NAICS Code: 221112 NAICS Description: Electric power generation, fossil fuel

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

See attached narrative.

16. Additional information provided in attachments as listed below:

Attachment A - Area Map and Process Flow Diagram

Attachment B - Emission Calculations

Attachment C - RBLC Search Results

Attachment D - SIP Permit Application Forms

Attachment E - Minimum Load Project Information

Attachment F - Volume II – Modeling Report

17. Additional Information: Unless previously submitted, include the following two items:

☒ Plot plan/map of facility location or date of previous submittal: See Appendix A

☒ Flow Diagram or date of previous submittal: See Appendix A

18. Other Environmental Permitting Needs:

Will this facility/modification trigger the need for environmental permits/approvals (other than air) such as Hazardous Waste Generation, Solid Waste Handling, Water withdrawal, water discharge, SWPPP, mining, landfill, etc.?

☒ **No** ☐ **Yes, please list below:**

19. List requested permit limits including synthetic minor (SM) limits.

See attached narrative.

20. Effective March 1, 2019, permit application fees will be assessed. The fee amount varies based on type of permit application. Application acknowledgement emails will be sent to the current registered fee contact in the GECO system. If fee contacts have changed, please list that below:

Fee Contact name: Courtney Adcock

Fee Contact email address: courtney.adcock@opc.com

Fee Contact phone number: 770-270-7678

Fee invoices will be created through the GECO system shortly after the application is received. It is the applicant's responsibility to access the facility GECO account, generate the fee invoice, and submit payment within 10 days after notification.

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
CT1	Combustion Turbine General Electric 7FA	General Electric 7FA	Combustion Turbine
DB1	Supplementary Fired Heat Recovery Steam Generator (i.e. Duct Burner)	COEN	Duct Burner w/Low NOx burner to supplement HRSG
CT2	Combustion Turbine General Electric 7FA	General Electric 7FA	Combustion Turbine
DB2	Supplementary Fired Heat Recovery Steam Generator (i.e. Duct Burner)	COEN	Duct Burner w/Low NOx burner to supplement HRSG
CT3	Combustion Turbine General Electric 7FA	General Electric 7FA	Combustion Turbine
DB3	Supplementary Fired Heat Recovery Steam Generator (i.e. Duct Burner)	COEN	Duct Burner w/Low NOx burner to supplement HRSG
CT4	Combustion Turbine General Electric 7FA	General Electric 7FA	Combustion Turbine
DB4	Supplementary Fired Heat Recovery Steam Generator (i.e. Duct Burner)	COEN	Duct Burner w/Low NOx burner to supplement HRSG

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 2.01 – BOILERS AND FUEL BURNING EQUIPMENT

Emission Unit ID	Type of Burner	Type of Draft[1]	Design Capacity of Unit (MMBtu/hr Input)	Percent Excess Air	Dates		Date & Description of Last Modification
					Construction	Installation	
CCCT1	Combined Combustion Turbine and Duct Burner (CT1 and DB1)	N/A	2,594 MMBtu/hr[2]		2000	May 2001	N/A
CCCT2	Combined Combustion Turbine and Duct Burner (CT2 and DB2)	N/A	2,594 MMBtu/hr[2]		2000	May 2001	N/A
CCCT3	Combined Combustion Turbine and Duct Burner (CT3 and DB3)	N/A	2,594 MMBtu/hr[2]		2000	May 2001	N/A
CCCT4	Combined Combustion Turbine and Duct Burner (CT4 and DB4)	N/A	2,594 MMBtu/hr[2]		2000	May 2001	N/A

[1] This column does not have to be completed for natural gas only fired equipment.

[2] 2,594 MMBtu/hr represents the maximum short-term heat input capacity of each CCCT once the AGP Project III is complete. The maximum annual heat input capacity for sustainable operation will be 21.35 million MMBtu/yr per CCCT.

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FUEL DATA

Emission Unit ID	Fuel Type	Potential Annual Consumption				Hourly Consumption		Heat Content		Percent Sulfur		Percent Ash in Solid Fuel	
		Total Quantity		Percent Use by Season									
		Amount	Units	Ozone Season May 1 - Sept 30	Non-ozone Season Oct 1 - Apr 30	Max.	Avg.	Min.	Avg.	Max.	Avg.	Max.	Avg.
CCCT1	Natural Gas	21.35	Million MMBtu/yr			2,594 MMBtu/hr	Varies	~1,020 MMBtu/ MMscf	~1,020 MMBtu/ MMscf				
CCCT2	Natural Gas	21.35	Million MMBtu/yr			2,594 MMBtu/hr	Varies	~1,020 MMBtu/ MMscf	~1,020 MMBtu/ MMscf				
CCCT3	Natural Gas	21.35	Million MMBtu/yr			2,594 MMBtu/hr	Varies	~1,020 MMBtu/ MMscf	~1,020 MMBtu/ MMscf				
CCCT4	Natural Gas	21.35	Million MMBtu/yr			2,594 MMBtu/hr	Varies	~1,020 MMBtu/ MMscf	~1,020 MMBtu/ MMscf				

Fuel Supplier Information

Fuel Type	Name of Supplier	Phone Number	Supplier Location			
			Address	City	State	Zip
Pipeline Quality Natural Gas						

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
SCR1	CCCT1 (CT1 and DB1 Combined)	Selective Catalytic Reduction	2001	Peerless	N/A		Stack Outlet is 211°F	< 920,000
SCR2	CCCT2 (CT2 and DB2 Combined)	Selective Catalytic Reduction	2001	Peerless	N/A		Stack Outlet is 211°F	< 920,000
SCR3	CCCT3 (CT3 and DB3 Combined)	Selective Catalytic Reduction	2001	Peerless	N/A		Stack Outlet is 211°F	< 920,000
SCR4	CCCT4 (CT4 and DB4 Combined)	Selective Catalytic Reduction	2001	Peerless	N/A		Stack Outlet is 211°F	< 920,000

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
SCR1	NO_X	~85%	< 85%	~181.5	GE Data	~36.3		N/A
SCR2	NO_X	~85%	< 85%	~181.5	GE Data	~36.3		N/A
SCR3	NO_X	~85%	< 85%	~181.5	GE Data	~36.3		N/A
SCR4	NO_X	~85%	< 85%	~181.5	GE Data	~36.3		N/A

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
CCCT1	SCR1	ST1	See emission calculations in Volume I Appendix B: Emission Calculations					
CCCT2	SCR2	ST2	See emission calculations in Volume I Appendix B: Emission Calculations					
CCCT3	SCR3	ST3	See emission calculations in Volume I Appendix B: Emission Calculations					
CCCT4	SCR4	ST4	See emission calculations in Volume I Appendix B: Emission Calculations					

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 5.00 MONITORING INFORMATION

Emission Unit ID/ APCD ID	Emission Unit/APCD Name	Monitored Parameter		Monitoring Frequency
		Parameter	Units	
CCCT1	Combined Combustion Turbine and Duct Burner (CT1 and DB1)	CO, NO_X	ppmvd @ 15% O_2	3-Hour Rolling Average
CCCT2	Combined Combustion Turbine and Duct Burner (CT2 and DB2)	CO, NO_X	ppmvd @ 15% O_2	3-Hour Rolling Average
CCCT3	Combined Combustion Turbine and Duct Burner (CT3 and DB3)	CO, NO_X	ppmvd @ 15% O_2	3-Hour Rolling Average
CCCT4	Combined Combustion Turbine and Duct Burner (CT4 and DB4)	CO, NO_X	ppmvd @ 15% O_2	3-Hour Rolling Average

Comments:

OPC requests that NSPS Subpart GG and NSPS Subpart Da Monitoring & Testing conditions be removed since the facility will no longer be subject to these subparts after the proposed AGP Project III. OPC also requests that NSPS Subpart KKKK related Monitoring & Testing conditions be added as the combined cycle combustion turbines will be subject to that subpart after the proposed AGP Project III.

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 7.00 – AIR MODELING INFORMATION: Stack Data

Stack ID	Emission Unit ID(s)	Stack Information			Dimensions of largest Structure Near Stack		Exit Gas Conditions at Maximum Emission Rate			
		Height Above Grade (ft)	Inside Diameter (ft)	Exhaust Direction	Height (ft)	Longest Side (ft)	Velocity (ft/sec)	Temperature (°F)	Flow Rate (acfm)	
									Average	Maximum
CCCT1	CT1 and DB1	160.1	18.0	Unobstructed Up	See Volume II Modeling Report		60	211	< 920,000	920,000
CCCT2	CT2 and DB2	160.1	18.0	Unobstructed Up	See Volume II Modeling Report		60	211	< 920,000	920,000
CCCT3	CT3 and DB3	160.1	18.0	Unobstructed Up	See Volume II Modeling Report		60	211	< 920,000	920,000
CCCT4	CT4 and DB4	160.1	18.0	Unobstructed Up	See Volume II Modeling Report		60	211	< 920,000	920,000
AUX_1	AUXB1	50	2	Unobstructed Up	See Volume II Modeling Report		51.7	400	<9,750	9,750
AUX_2	AUXB2	65	2	Unobstructed Up	See Volume II Modeling Report		51.7	400	<9,750	9,750

NOTE: If emissions are not vented through a stack, describe point of discharge below and, if necessary, include an attachment. List the attachment in Form 1.00 *General Information*, Item 16.

Facility Name: Thomas A. Smith Energy Facility **Date of Application:** April 2019

FORM 7.00 AIR MODELING INFORMATION: Chemicals Data

Chemical	Potential Emission Rate (lb/hr)	Toxicity	Reference	MSDS Attached
See Volume II – Modeling Report				☐
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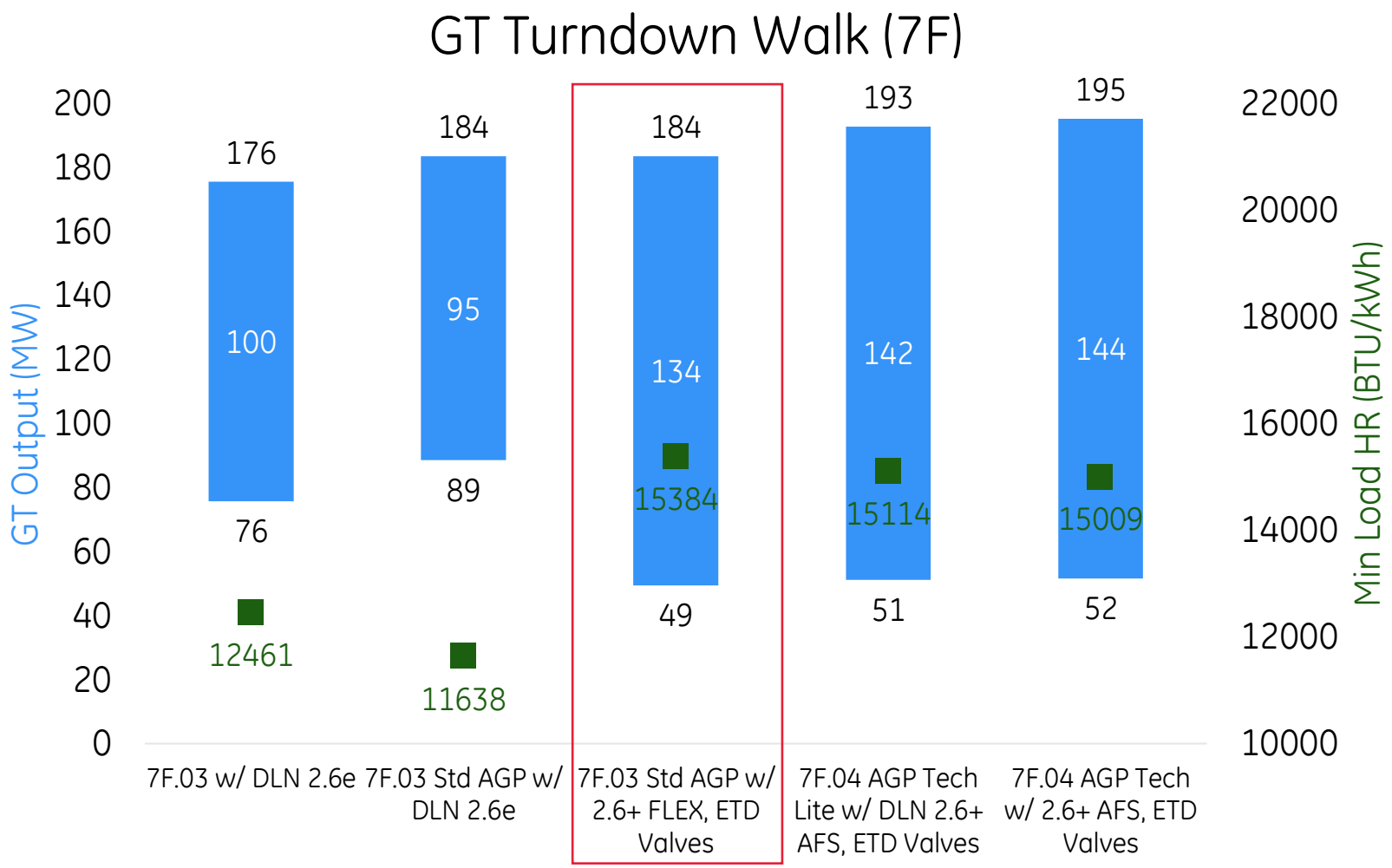
APPENDIX E: MINIMUM LOAD PROJECT INFORMATION

7F Power FLEXEFFICIENCY*

Emissions compliant load range capability (ISO nominal)



imagination at work

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