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December 21, 2006

Trina L. Vielhauer, Chief
Bureau of Air Regulation
Division of Air Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: JEA Kennedy Generating Station CT8 Air Construction Permit Application

Dear Ms. Vielhauer:

On behalf of JEA, enclosed please find an original and four (4) copies of an air construction permit application for the installation of a new combustion turbine, designated CT8, at the JEA Kennedy Generating Station. Please see the application support document for a more detailed description of the new construction associated with the application. Also enclosed is a check in the amount of $7,500.00 for the permit processing fee for this application.

If you have any questions, please contact Bert Gianazza, P.E. of JEA at (904) 665-6247.

Sincerely,

Bob Holmes

Bob Holmes
Air Quality Scientist
BLACK & VEATCH

Enclosure[s]

cc: Bert Gianazza, P.E., JEA
David Norse, JEA
Jack Miller, B&V

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

December 28, 2006

Mr. John Bunyak, Chief
Policy, Planning & Permit Review Branch
NPS – Air Quality Division
P. O. Box 25287
Denver, Colorado 80225

RE: JEA Kennedy Generating Station CT8
0310047-015-AC, PSD-FL-386

Dear Mr. Bunyak:

Enclosed for your review and comment is a PSD permit application from JEA for the installation of a new combustion turbine (CT8) at the Kennedy Generating Station in Jacksonville, Duval County, Florida.

Your comments may be forwarded to my attention at the letterhead address or faxed to the Bureau of Air Regulation at 850/921-9533. If you have any questions, please contact Bruce Thomas, review engineer, at 850/921-7744.

Sincerely,

Patty Adams

for Jeffrey F. Koerner, Program Administrator
Permitting North Section

JFK/pa

Enclosure

cc: B. Thomas

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

December 28, 2006

Mr. Gregg M. Worley, Chief
Air Permits Section
U.S. EPA, Region 4
61 Forsyth Street
Atlanta, Georgia 30303-8960

RE: JEA Kennedy Generating Station CT8
0310047-015-AC, PSD-FL-386

Dear Mr. Worley:

Enclosed for your review and comment is a PSD permit application from JEA for the installation of a new combustion turbine (CT8) at the Kennedy Generating Station in Jacksonville, Duval County, Florida.

Your comments may be forwarded to my attention at the letterhead address or faxed to the Bureau of Air Regulation at 850/921-9533. If you have any questions, please contact Bruce Thomas, review engineer, at 850/921-7744.

Sincerely,

Patty Adams

Jeffrey F. Koerner, Program Administrator
Permitting North Section

JFK/pa

Enclosure

cc: B. Thomas

Prevention of Significant Deterioration Air Permit Application for Kennedy Generating Station CT8

Submitted by

JEA

Prepared by
Black & Veatch

December 2006
Project No. 145485

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1.0 Introduction

JEA proposes to install a Combustion Turbine (CT) at the existing Kennedy Generating Station (KGS) (herein after referred to as the Project), in Jacksonville, Duval County, Florida. The new unit will be a General Electric (GE) 7FA Simple Cycle CT (CT8) operating at a nominal rating of 172 MW with natural gas firing at an ambient temperature of 59°F. Note that at the site minimum temperature with fuel oil firing the expected gross combustion turbine generator output is 197 MW.

This report is a technical support document for the Prevention of Significant Deterioration Air Permit Application. The following sections contain a project characterization, regulatory review, best available control technology (BACT) determination, air quality impact analysis (AQIA), and additional impact analyses designed to provide a basis for the Florida Department of Environmental Protection's (FDEP) preparation of an air construction permit for the Project.

2.0 Project Characterization

The following sections characterize the Project, including a general description of the location, facility, and emission unit, as well as a summary of the estimated emissions and a discussion of New Source Review (NSR) applicability and a regulatory review.

2.1 Project Location

The Project is located in Duval County, in the City of Jacksonville. The approximate UTM coordinates of the site are 439,819.41 m East and 3,359,161.53 m North (Zone 17). The nearest Federal Prevention of Significant Deterioration (PSD) Class I Area is Okefenokee Wilderness (OW), located approximately 55 km northwest of the Project site. Other Class I Areas within 300 km of the project site are: Wolf Island (110 km away), Chassahowitzha (203 km away), and Saint Marks (227 km away). The topography of the area is unpronounced and considered relatively flat.

The existing facility primarily consists of three nominal 56.2 MW simple cycle oil-fired CTs and one GE 7FA simple cycle CT with natural gas as the primary fuel and low sulfur No. 2 fuel oil as the backup fuel. The following is the start-up dates for each of these existing units:

- Combustion Turbine No. 3 (CT3) – May 13, 1973
- Combustion Turbine No. 4 (CT4) – August 24, 1973
- Combustion Turbine No. 5 (CT5) – July 1, 1973
- Combustion Turbine No. 7 (CT7) – April 30, 2000

2.2 Project Description

The Project installation will be a Simple Cycle Combustion Turbine (CT8). CT8 will be dual fueled with natural gas as the primary fuel and fuel oil as an alternate fuel. CT8 will have a nominal rating of 176 MW with natural gas firing at an ambient temperature of 59°F. Note that at the site minimum temperature with fuel oil firing the expected gross combustion turbine generator output is 197 MW. No additional auxiliary equipment that would be a source of air emissions will be included with the project. Existing fuel oil storage tanks will be used to store the fuel oil for CT8.

With this application JEA is requesting that the construction permit for CT8 require the permanent shutdown of CT3, CT4, and CT5. It is requested that the permanent shutdown of these units be effective on the day of initial startup of CT8. The permanent shutdown of these units provides facility emission decreases that are used in a netting analysis for CT8. Through the netting analysis it is demonstrated that the CT8 project net emissions increase of all prevention of significant deterioration (PSD)

pollutants except PM and PM_{10} are below the PSD major modification thresholds. As such, only PM and PM_{10} are subject to PSD permitting for this project. This is discussed in more detail in Section 2.5.

2.2.1 Combustion Turbine

This application is based on installation of a GE 7FA simple cycle combustion turbine. The combustion turbine unit will include the following major features:

- Dual fuel firing system using natural gas or low sulfur fuel oil.
- Dry low NO_x combustion system for natural gas firing.
- Water injection system for NO_x reduction when firing fuel oil.
- Static inlet filtration.
- Mark VI control system.

2.2.2 Mode of Operation

CT8 is designed for continuous hours of operation on natural gas and fuel oil. However, as discussed later, operational limits are requested as part of this application to net out of PSD for certain pollutants.

2.2.3 Fuel

The fuel for CT8 will be natural gas and No. 2 low sulfur (0.05 percent sulfur) fuel oil. Natural gas will be delivered to the site by existing pipelines. Fuel oil delivery will be by truck or barge. An existing truck unloading and transfer station and existing fuel oil tanks will be used to handle and store fuel oil used in CT8. This application is for 5,000 hours per year of overall CT8 operation and up to 800 hours per year of operation with low-sulfur fuel oil.

2.3 Project Emissions

This section discusses the potential to emit (PTE) of all regulated PSD air pollutants resulting from the Project. Emissions from the Project will only be generated from the General Electric 7FA SCCT (CT8). Performance data for CT8 at loads of 50, 75, and 100 percent, natural gas or distillate fuel oil firing, and ambient air temperatures of 7° F, 59° F, 68.8° F, and 105° F were used to determine emission and stack parameters used in the modeling analysis.

Ambient temperature data were selected based on meteorological data from Duval County, Florida. An ambient temperature of 7° F represents the winter seasonal minimum site temperature and corresponds to maximum heat input and power generation. An ambient temperature of 68.8° F represents the average annual site

temperature, which is representative of the average heat input rate. An ambient temperature of 105° F represents the summer seasonal maximum site temperature and corresponds to the lowest heat input rate for the combustion turbine. An ambient temperature of 59° F represents ISO conditions.

The maximum pound per hour emission rates (rounded to the nearest tenth of a pound) considering all ambient temperatures are presented in Table 2-1.

Table 2-1
CT8 Maximum Emission Rates (lb/h)

Pollutant	Natural Gas Firing (lb/h)		Distillate Oil Firing (lb/h)	
	Maximum[(a)]	At 59°F	Maximum[(a)]	At 59°F
NO_x[(b)]	108.3	98.3	335.0	325.0
SO_2[(c)]	11.7	10.6	105.8	102.7
CO[(d)]	32.0	29.0	66.0	66.0
PM/PM_{10} (front and back half)	19	19	45	45
VOC	3.2	2.8	7.5	7.5
SAM	1.2	1.1	11.1	10.8

(a) Maximum pound per hour emission rates (rounded to the nearest tenth of a pound) for CT8 considering all operating loads and ambient temperatures.
(b) NO_x emissions are based on a NO_x emissions rate of 15 ppmvd at 15 percent O_2 when firing natural gas and 42 ppmvd at 15 percent O_2 when firing fuel oil.
(c) Based on a natural gas sulfur content of 2 grains/100 scf and the use of low-sulfur fuel oil with a 0.05 percent sulfur content.
(d) CO emissions are based on a CO emissions rate of 9 ppmvd when firing natural gas and 20 ppmvd when firing fuel oil.

2.4 Maximum Project Potential to Emit

The potential to emit (PTE) for CT8 was estimated based on the maximum hourly emission rate for each pollutant at an ambient temperature of 59° F (ISO conditions), considering operation at 100 percent load, 5,000 hours per year of total CT8 operation and up to 800 hours per year operation with low sulfur fuel oil.

The Project's PTE for each pollutant is summarized in Table 2-2. The footnotes in Table 2-2 provide the basis for the PTE values. The applicable prevention of significant deterioration (PSD) significant emission rates (SERs) for each pollutant are also included in Table 2-2 for reference purposes. Note that this is only the first step in determining PSD applicability for the project. PSD is only applicable to those pollutants for which there is a significant emissions increase and a significant net emissions

increase. The analysis to determine whether there is a significant net emissions increase is commonly referred to as a netting analysis and is discussed further in Section 2.5.

Table 2-2
Initial PSD Applicability
(Without Considering Netting)

Pollutant	Project PTE[a,b] (tpy)	PSD Significant Emission Rate (tpy)	PSD Review Required
NO_x	336.4	40	Yes
SO_2	63.3[c]	40	Yes
CO	87.3	100	No
PM	57.9[d]	25	Yes
PM_{10}	57.9[d]	15	Yes
VOC	8.9	40	No
Sulfuric Acid Mist	6.6[c,e]	7	No
Total Reduced Sulfur	negl.	10	No
Hydrogen Sulfide	negl.	10	No
Vinyl Chloride	negl.	1	No
Total Fluorides	negl.	3	No
Mercury	0.001[f]	0.1	No
Lead	0.011[f]	0.6	No

(a) Regardless of fuel used, emissions are based on operation of the combustion turbine at 100 percent load and at an average ambient temperature of 59° F.
(b) Based on firing low-sulfur fuel oil for 800 hours per year in the combustion turbine and firing natural gas for the remainder of the 5,000 hours per year of overall operation.
(c) Based on a natural gas sulfur content of 2 grains/100 scf and the use of low-sulfur fuel oil with a 0.05 percent sulfur content.
(d) Includes front and back half PM/PM_{10} emissions.
(e) Includes 5% SO_2 oxidation to SO_3 and assumes 100 percent conversion of SO_3 to sulfuric acid mist (H_2SO_4).
(f) Based on AP-42 emission factors found in Section 3.1 – Stationary Gas Turbines, Tables 3.1-3, 3.1-4, and 3.1-5.

2.5 New Source Review Applicability

The federal Clean Air Act (CAA) New Source Review (NSR) provisions are implemented for new major stationary sources and major modifications under two programs: the Prevention of Significant Deterioration (PSD) program outlined in 40 Code of Federal Regulations (CFR) 51 and 52.21, and the Nonattainment NSR program outlined in 40 CFR 51 and 52. The facility is in an attainment or unclassifiable area with respect to all pollutants. As such, the PSD program will apply to the Project, as administered by the state of Florida under 62-212.400, F.A.C., Stationary Sources – Preconstruction Review, Prevention of Significant Deterioration.

2.5.1 Prevention of Significant Deterioration

Because the KGS site is in an area classified as attainment or unclassifiable for all criteria pollutants, NSR applicability is governed by the PSD regulations. The PSD regulations are designed to ensure that the air quality in existing attainment areas does not significantly deteriorate or exceed the ambient air quality standards (AAQS), while providing a margin for future industrial and commercial growth. PSD regulations apply to major stationary sources and major modifications at existing major sources undergoing construction in areas designated as attainment or unclassifiable.

A major stationary source is defined as any one of the listed major source categories which emits, or has the potential to emit, 100 tpy or more of any regulated pollutant, or 250 tpy or more of any regulated pollutant if the facility is not one of the listed major source categories. The KGS facility both before and after the project is not considered a named source category with a 100 tons per year (tpy) PSD major source threshold level. As such, the KGS facility has a 250 tpy major source threshold level. Because the existing KGS facility has a potential to emit (PTE) of greater than 250 tpy for at least one PSD pollutant, it is considered an existing major PSD source. As such, a determination of whether the Project results in a PSD major modification of the facility is based on whether the Project itself results in an annual emissions increase above the PSD significant emission rates (SERs) and if it results in a net emissions increase above the SER levels. A common term for the net emissions increase analysis is netting, which will be discussed in greater detail later. The PSD SERS are given in Table 2-2. The CT8 potential emissions with the proposed annual operating limitations exceed the PSD SERs for NO_x, SO_2, PM, and PM_{10}. However, a netting analysis to account for emission decreases resulting from the shut down of existing CTs at the facility can be used to demonstrate that the net emissions increase is not greater than the SERs for some of these pollutants. Through the netting analysis, it is shown that only the net emissions increase

of PM and PM_{10} are greater than their respective SER. As such, only PM and PM_{10} are subject to PSD permitting. The PSD review includes a BACT analysis, air quality impact analysis (AQIA), and an assessment of the Project's total impact on general residential and commercial growth, soils and vegetation, and visibility, as well as a Class I impact analysis. These analyses are included in Sections 3.0, 4.0, and 5.0.

2.5.2 Netting Analysis

PSD applicability to a project is determined on a pollutant-by-pollutant basis by comparing the project emissions increase and net emissions increase to the PSD major modification SERs. This is a two-step process. For those pollutants for which the project emission increases are not greater than their respective PSD SER, they are not subject to PSD permitting. For those pollutants for which the Project emissions increase is greater than the respective SER, a second test as to whether the net emissions increase exceeds the respective SER can be used to determine PSD applicability. A determination of the net emissions increase is commonly referred to as a netting analysis. A netting analysis only provides a favorable result if there have been or will be emission reductions at the facility during what is termed the netting contemporaneous period. The netting contemporaneous period covers the period beginning five years prior to commencing construction on the new project and ending when emission increases from the new project are first realized. For this analysis, JEA is able to accept permit conditions that will require the permanent shutdown of three existing simple cycle combustion turbines (CT3, CT4, and CT5) at the Kennedy site. This will result in an emissions decrease at the site that can be used in the netting analysis. As shown in Table 2-2, only project emission increases of NO_x, SO_2, PM and PM_{10} are greater than their respective SERs. As such, only those pollutants would be candidates for the netting analysis to determine if project net emission increases are less than the SERs. Due to the relatively low AP-42 emission factors used to determine historical PM and PM10 emissions from the existing CTs, the PM and PM_{10} decreases resulting from the shutdown of the existing CTs is relatively small. As such, shutdown of CT3, CT4, and CT5 doesn't provide enough PM or PM_{10} emission reductions to make a netting analysis for these pollutants a viable approach to net out of PSD applicability for PM and PM_{10}. Therefoer, only NO_x and SO_2 emission increases are considered in the netting analysis. The following summarizes the approach used in conducting a netting analysis for the installation of CT8 at the JEA KGS and provides the results of the netting analysis.

The concept of baseline actual emissions (BAE) as defined in the PSD regulations and at 62-210.200(34)(b), F.A.C. is used in determining the historical emissions associated with the combustion turbines to be shut down. The BAE values are used to

quantify the decrease in emissions associated with the shutdown of each existing combustion turbine. The BAE is defined as the annual average emissions during any consecutive 24-month period during a defined number of years dating back from the change that resulted in the emissions decrease. The time period that one is able to use to determine the BAE levels will be called the look-back period. For electric utility steam generating units (EUSGUs) the look-back period is five years and for non-EUSGUs the look-back period is 10 years. Since the CTs that will be shut down are simple cycle turbines (thus non-EUSGUs), the look-back period used to determine their BAE is the 10 year period immediately preceding the date a complete application is received by the Department. The change that results in emission decreases is the shut down of the specified existing CTs. The requested shutdown date for CT3, CT4, and CT5 is the date CT8 becomes operational. Since the change to the existing CTs will be permanent shutdown, the post change emissions will be zero and the emissions decrease will be equal to the BAE. The BAE can be chosen on a pollutant-by-pollutant basis, so the 24-month period used to determine the BAE can be different for the different PSD pollutants.

For this specific netting analysis, the only emission increases and decreases occurring at the facility during the contemporaneous period are the emission decreases associated with the shutdown of the existing oil-fired combustion turbines and the emissions increase associated with installation of CT8. As such, the project net emissions increase will be the CT8 PTE minus the BAE levels from the existing oil-fired CTs. The existing oil-fired CT BAE levels are defined by the historical emissions analysis. The BAE emission levels for the three existing oil-fired CTs were calculated using USEPA AP-42 emission factors because unit specific emissions information for the oil-fired CTs was not available. In conjunction with the AP-42 emission factors, historical monthly fuel use and fuel sulfur content data was used to determine monthly emissions from the oil-fired CTs. The results of the BAE calculations for CT3, CT4, and CT5 are shown as emission decreases in Table 2-3. Tables showing the BAE calculations are included in Appendix A.

Hour per year permit limitations for CT8 are requested as part of this permit application. These requested limits effectively limit the potential emissions from CT8 as shown in Table 2-2 and Table 2-3. Table 2-3 shows the results of the netting analysis where the CT8 project nets out of PSD applicability for NO_x and SO_2 by limiting fuel oil firing in CT8 to 800 hours per year along with limiting total operation of CT8 to 5,000 hours per year. As such, PSD permitting for CT8 is only applicable to the pollutants PM and PM_{10}. Because the operational limitations effectively limit the potential to emit of CT8 to less than 100 tpy CO, there is no need to include a CO limit or require a CO

CEMS in the CT8 construction permit, since the tracking of operating hours is a means to demonstrate that CO emissions remain below the SERs. As such, JEA is requesting that the CT8 construction permit not include a CO emissions limit or require the use of a CO CEMS. This is in agreement with the approach taken in the most recent FDEP permit for a simple cycle combustion turbine at the Oleander Power Project where the permit did not include a CO limit or use of a CO CEMS, but CO emissions were effectively limited to less than 100 tpy through annual operating limits.

Table 2-3
Netting Results

	NO_x (tpy)	SO_2 (tpy)
Emission Decreases	371.3	94.3
CT8 Potential Emissions with CT8 limited to 800 hours of fuel oil firing and 5,000 hours of overall operation	336.4	63.3
Net Emissions Change	-34.9	-31.0
Significant Emission Rate	40	40
PSD Applicable	**NO**	**NO**

2.5.3 PSD Applicability Summary

In summary, the two-step PSD applicability determination process demonstrated that PSD is only applicable to PM and PM_{10} for the CT8 project. The first step of the PSD applicability determination comparing the CT8 project potential emissions with the SERs, as shown in Table 2-2, showed that all pollutants except NO_x, SO_2, PM and PM_{10} are not subject to PSD. The results of the netting analysis shown in Table 2-3, which is the second step of the two-step process, demonstrated that PSD is not applicable to NO_x or SO_2. As such, PSD is applicable only to PM and PM_{10} and this application only includes a BACT analysis and a modeling analysis for PM and PM_{10}, as required by PSD.

2.6 Regulatory Review

This section provides a review of rule applicability for CT8 beyond the NSR/PSD applicability covered in Section 2.5.

2.6.1 CT MACT

On March 5, 2004, the United States Environmental Protection Agency (EPA) published final national emission standards for hazardous air pollutants (NESHAP) for stationary combustion turbines. This rule, found at 40 CFR Part 63 Subpart YYYY, is commonly referred to as the CT MACT. The CT MACT is applicable to stationary gas turbines located at major sources of hazardous air pollutants (HAPs). A major source of HAPs is defined as a site that emits or has the potential to emit any single HAP at a rate of 10 tons or more per year or any combination of HAP at a rate of 25 tons or more per year. The existing KGS facility is not classified as a major source of HAPs. Because the shutdown of CT4, CT5, and CT6 will become affective prior to CT8 coming on-line, the post-project HAP emissions are based on only HAP emissions from existing CT7 and new CT8. Potential HAP emissions at the facility were estimated using USEPA AP-42 emission factors.

As mentioned, with the permanent retirement of CT3, CT4, and CT5, the primary post-project HAP sources at KGS will be CT7 and CT8. The HAP emissions for CT7 and CT8 can be calculated using United States Environmental Protection Agency (USEPA) AP-42 emission factors. Table 2-4 shows the potential post-project facility HAP emissions (CT7 and CT8 combined) calculated using AP-42 emission factors and maximum unit operation. Note that the worst case operating scenario for each unit based on the respective limit on hours of operation per fuel type was used to determine the individual HAP potential emission rates shown in Table 2-4. The total potential HAP emissions are based on the worst case fuel use option for each CT. As such, the sum of the individual potential HAP emissions will not equal the total HAP emissions rate shown in this table. As shown in Table 2-4, estimated potential HAP emissions from CT7 and CT8, and thus the facility, are less than the major source HAP levels. As such, the facility is not a major source of HAPs and the CT MACT is not applicable to CT8. Tables showing the HAP emission calculations are included in Appendix A.

Table 2-4 Post-Project Facility Potential HAP Emissions	
Pollutant	Potential Emissions (tons/year)
1,3 Butadiene	0.033
Acetaldehyde	0.312
Acrolein	0.050
Benzene	0.152
Ethylbenzene	0.249
Formaldehyde	5.536
Naphthalene	0.073
PAH	0.086
Propylene Oxide	0.226
Toluene	1.014
Xylenes	0.499
Arsenic	0.021
Beryllium	0.001
Cadmium	0.009
Chromium	0.021
Lead	0.027
Manganese	1.535
Mercury	0.002
Nickel	0.009
Selenium	0.049
Total HAPs	8.293

2.6.2 New Source Performance Standards (NSPS)

CT8 will be subject to the Standards of Performance for Stationary Combustion Turbines. This type of standard is commonly referred to as a new source performance standard (NSPS). This NSPS is found at 40 Code of Federal Regulations (CFR) 60 Subpart KKKK. This final rule was published in the Federal Register on July 6, 2006. Per Subpart KKKK, because the new turbine will be subject to Subpart KKKK, the

turbine will not be subject to NSPS Subpart GG. Subpart KKKK includes standards for regulation of NO_x and SO_2, as follows:

NO_x—15 ppm at 15 percent O_2 or 54 ng/J of useful output (0.43 lb/MWh) – new turbines firing natural gas with > 850 mmBtu/hr heat input.

NO_x—42 ppm at 15 percent O_2 or 160 ng/J of useful output (1.3 lb/MWh) – new turbines firing fuel oil with > 850 mmBtu/hr heat input.

NO_x—96 ppm at 15 percent O_2 or 590 ng/J of useful output (4.7 lb/MWh) – turbines operating at less than 75 percent of peak load – turbines with > 30 MW output.

SO_2—the rule includes a fuel emission standard or a fuel sulfur standard equivalent to potential SO_2 emissions of 0.060 lb SO_2/mmBtu.

These NSPS standards will be met by CT8.

2.6.3 Excess Emissions

As with other combustion turbines of this size and type, excess emissions during startup, shutdown, malfunction, DLN tuning, and fuel switching are likely to occur and are accounted for in FDEP permitting of combustion turbines. In accordance with Rule 62-210.700, F.A.C., JEA is requesting that the permit allow for 2 hours of excess emissions in any 24 hour period due to startup, shutdown, malfunction or fuel switching (a fuel switch is considered a form of startup). It is also recognized that excess emissions may occur during DLN tuning. JEA is requesting that the permit include the following condition in regards to allowing for excess emissions during DLN tuning sessions.

> DLN tuning: CEMS data collected during initial or other DLN tuning sessions may be excluded from the compliance demonstrations provided the tuning session is performed in accordance with the manufacturer's specifications or determined best practices. Prior to performing any tuning session, the permittee shall provide the Compliance Authority with an advance notice of at least one (1) day that details the activity and proposed tuning schedule. The notice may be by telephone, facsimile transmittal, or electronic mail.

2.7 Requested Permit Conditions

As previously discussed, based on the CT8 PTE and the netting analysis, the project is applicable to PSD permitting for only PM and PM_{10}. BACT for PM/PM_{10} is the use of natural gas as a primary fuel and low sulfur fuel oil as a backup fuel and good combustion control. JEA is requesting that the permit include a 10 percent opacity limit as an indicator of good combustion control.

JEA is requesting that the permit allow for 5,000 hours per year of total CT8 operation, with the primary fuel listed as natural gas with a maximum sulfur content of 2 grains per 100 scf. We also request that the permit allow up to 800 hours per year of fuel oil firing with a maximum fuel oil sulfur content of 0.05 percent sulfur.

JEA is requesting that the permit include NO_x limits of 15 ppmvd at 15 percent O_2 when firing natural gas and 42 ppmvd at 15 percent O_2 when firing fuel oil. These NO_x limits are consistent with the NSPS Subpart KKKK NO_x standards.

Because the requested operational limitations effectively limit the potential to emit of CT8 to less than 100 tpy CO, there is no need to include a CO limit or require a CO CEMS in the CT8 construction permit, since the tracking of operating hours is a means to demonstrate that CO emissions remain below the SERs. As such, JEA is requesting that the CT8 construction permit not include a CO emissions limit or require the use of a CO CEMS. This is in agreement with the approach taken in the most recent FDEP permit for a simple cycle combustion turbine at the Oleander Power Project where the permit did not include a CO limit or use of a CO CEMS, but CO emissions were effectively limited to less than 100 tpy through annual operating limits.

3.0 Best Available Control Technology

As discussed in Section 2.5, the only pollutants subject to PSD permitting for the Project are PM and PM_{10}. As such, a best available control technology (BACT) analysis is only required for PM/PM_{10}.

PM/PM_{10} emissions from the combustion turbine are a result of incomplete combustion and trace particulate parameters in the fuel. The emissions of particulate matter from CT8 will be minimized by ensuring as complete combustion of the fuel as possible. The NSPS for combustion turbines do not establish a particulate emission limit. Natural gas, the primary fuel, contains only trace quantities of non-combustible material.

The manufacturer's standard operating procedures include filtering the turbine inlet air and combustion controls. The BACT/LAER Clearinghouse documents do not list any post-combustion particulate matter control technologies being used on combustion turbines. Consistent with the previous determinations by the State of Florida, such as the FPL Turkey Point, FPL Martin, FPL Manatee, FPL Fort Myers, and FMPA Treasure Coast Energy Center, the use of combustion controls and natural gas (low sulfur fuel) is considered BACT for particulate matter and is proposed for CT8. Low sulfur fuel oil will be used as a backup fuel. Good combustion controls, the use of natural gas as a primary fuel and limited use of low-sulfur fuel oil as the backup fuel in the combustion turbine is considered BACT.

4.0 Air Quality Impact Analysis

The following sections discuss the air dispersion modeling performed for the PSD air quality impact analysis for those PSD pollutants which will have a PTE greater than the PSD significant emission rate (i.e. PM/PM_{10}). The air dispersion modeling analysis was conducted in accordance with EPA's air dispersion modeling guidelines (incorporated as Appendix W of 40 CFR 51), as well as a mutually agreed upon air dispersion modeling protocol submitted to FDEP on behalf of JEA in a letter from Black & Veatch dated October 10, 2006. A copy of the protocol is presented in Appendix F.

4.1 Model Selection

Consistent with the Appendix W *Guideline on Air Quality Models*, the American Meteorological Society/Environmental Protection Agency (AMS/EPA) Regulatory Model (AERMOD) (Version 04300) air dispersion model was used to predict maximum ground-level concentrations associated with the project's emissions. AERMOD is the product of AMS/EPA Regulatory Model Improvement Committee (AERMIC), formed to introduce state-of-the-art modeling concepts into USEPA's air quality models. AERMOD incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. The AERMOD model includes a wide range of options for modeling air quality impacts of pollution sources.

4.2 Model Input and Options

This section discusses the model input parameters, source and emission parameters, and the AERMOD model default options and input databases.

4.2.1 Model Input Source Parameters

The AERMOD model was used to determine the maximum predicted ground-level concentration for each pollutant and applicable averaging period resulting from various operating loads, fuels, and ambient temperatures. Performance data for the combustion turbine operating with separate fuels (natural gas and low sulfur fuel oil) at several different loads (50, 75, and 100 percent) over a range of ambient temperatures (7, 59, 68.8, and 105° F) are included in Appendix B. The corresponding stack parameters and emission rates for each load and ambient temperature considered in the analysis are presented in Table 4-1. For the three different load cases, the parameters in Table 4-1 are "enveloped" over the different ambient temperature operating scenarios as provided in Appendix B. "Enveloping" is the process in which a representative set of stack

parameters and pollutant emission rates are utilized to produce the worst-case plume dispersion conditions and highest model predicted concentrations (i.e., lowest exhaust temperature and exit velocity and the highest emission rate).

4.2.2 GEP Stack Height Determination

The Project's buildings and structures were analyzed to determine their potential to influence the dispersion of stack emissions. Building and structure dimensions, as well as relative locations, were entered into EPA's Building Profile Input Program (BPIP) to produce an AERMOD input file with the proper Huber-Snyder or Schulman-Scire direction specific building downwash parameters. The BPIP formula GEP height for the simple cycle CT8 stack is 65 m (213 ft). The Project stack height is 27.43 m (90 ft). As such, direction-specific downwash parameters from the BPIP program were included in the AERMOD air dispersion modeling analysis.

Table 4-1
Stack Parameters and Pollutant Emissions
Used in AERMOD Modeling Analysis

Fuel[a]	Load	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temp (°F)	Pollutant Emission Rate (lb/h) PM/PM_{10}[b]
NG	100	90	18	144.5	1,060	19
	75	90	18	124.1	1,118	19
	50	90	18	104.5	1,169	19
FO	100	90	18	150.2	1,094	45
	75	90	18	127.0	1,127	43
	50	90	18	107.9	1,175	41

[a]NG – Natural Gas, FO – Ultra Low Sulfur Fuel Oil.
[b]PM/PM_{10} represents both front and back half emissions.

4.2.3 Model Defaults

Since the AERMOD model is especially designed to support the USEPA's regulatory modeling programs, the regulatory modeling options are considered the default mode of operation for the model. These options include the use of stack-tip downwash and a routine for processing averages when calm winds or missing meteorological data occur.

4.2.4 Receptor Grid and Terrain Considerations

The air dispersion modeling receptor locations was established at appropriate distances to ensure sufficient density and aerial extent to adequately characterize the pattern of pollutant impacts in the area. Specifically, a nested rectangular grid network that extends out 10 km from the center of the site location was used and a fence line with receptors spaced at 50 km apart. The nested rectangular grid network consists of three tiers: the first tier extends from the center of the site to 1 km with 100 m spacing; the second tier extends from 1 km to 5 km with 500 m spacing; and the third tier extends from 5 km to 10 km with 1,000 m spacing. Figure 4-1 illustrates the nested rectangular grid, fence line receptors, and the relative location of the emission source and downwash structures.

Given terrain typical of Florida and commensurate with previous air dispersion modeling studies for FDEP, terrain elevations will not be incorporated in this analysis.

4.2.5 Meteorological Data

The AERMOD model utilizes a file of surface boundary layer parameters and a file of profile variables including wind speed, wind direction, and turbulence parameters. These two types of meteorological inputs are generated by the meteorological preprocessor for AERMOD, which is called AERMET (Version 04300). AERMET includes three stages of preprocessing of the meteorological data. The first two stages extract, quality check, and merge the available meteorological data. The third stage requires input of certain surface characteristics (surface roughness, Bowen ratio, and Albedo) from the area of concern.

AERMET requires hourly input of specific surface and upper air meteorological data. These data at a minimum include the wind flow vector, wind speed, ambient temperature, cloud cover, and morning radiosonde observation, including height, pressure, and temperature. Surface characteristics in the vicinity of the emissions sources are important in determining the boundary layer parameter estimates. Obstacles to the wind flow, amount of moisture at the surface, and reflectivity of the surface affect the calculations of the boundary layer parameters and are quantified by the following variables: surface roughness length, surface Albedo, and Bowen ratio, respectively.

The meteorological data used in this analysis was a five year set of AERMET processed meteorological data with parameters input for the Jacksonville area. This data set was provided by and processed for the data period of 2001-2005 by Florida Department of Environmental Protection (FDEP) and was AERMOD ready.

4.3 Model Results

As presented in Section 2.0, the Project's net emissions increase exceeds the PSD significant emission rates for PM/PM_{10}. In accordance with the approved modeling protocol, AERMOD air dispersion modeling was performed (as described in the preceding sections) using the emission rates for PM/PM_{10} for each applicable averaging period. Table 4-2 compares the maximum model predicted concentrations for the pollutant and applicable averaging periods with the PSD Class II significant impact levels (SILs) and the pre-construction monitoring requirements. As Table 4-2 indicates, the Project's maximum model-predicted concentrations are less than the PSD Class II SILs for the pollutant and applicable averaging periods. Therefore, under the PSD program, no further air quality impact analyses (i.e., PSD increment and Ambient Air Quality Standards analyses) are required.

Additionally, the maximum predicted concentrations are less than the pre-construction monitoring de minimis levels for each pollutant and applicable averaging period. Therefore, by this application, the applicant requests an exemption from the PSD pre-construction monitoring requirements.

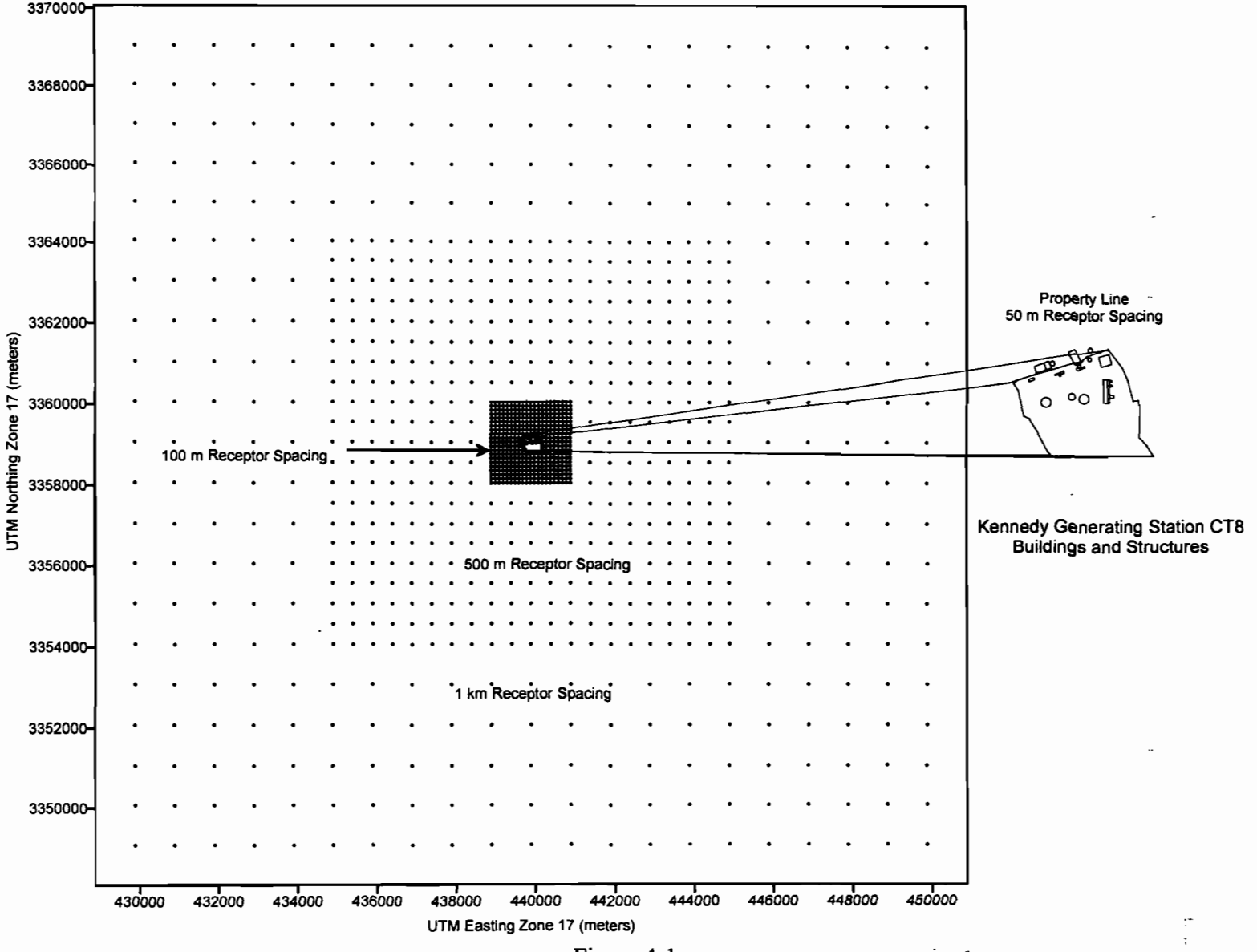


Figure 4-1
Receptor Location Plot

Table 4-2
AERMOD Model-Predicted Class II Impacts

Pollutant	Averaging Period	Model-Predicted Impact[a] ($\mu g/m^3$)						PSD Class II SIL[b] ($\mu g/m^3$)	Exceed SIL?	De Minimis Monitoring Level[c] ($\mu g/m^3$)	Pre-Construction Monitoring Required?
		Natural Gas			Fuel Oil						
		100%	75%	50%	100%	75%	50%				
PM/PM_{10}[d]	Annual	0.0225	0.0264	0.0316	0.0502	0.0579	0.0657	1	NO	--	NO
	24 Hour	0.2435	0.2790	0.3341	0.5495	0.6152	0.6916	5	NO	10	NO

[a]Impacts represent the highest first high model-predicted concentration from all 5 years of meteorological data modeled at each corresponding load.
[b]Predicted impacts that are below the specified level indicate that the project will not have predicted significant impacts and further modeling is not necessary.
[c]This criteria is used to determine if pre-construction ambient air monitoring is required to assess current and future compliance with Ambient Air Quality Standards.
[d]Note that the PM_{10} impacts are below the PSD Class II SILs and the NAAQS for $PM_{2.5}$ are significantly greater than the PM_{10} SILs. Therefore, if one were to conservatively assume that $PM_{2.5}$ impacts would be the same as the PM_{10} impacts, then the impacts would be significantly below the $PM_{2.5}$ NAAQS.

5.0 Additional Impact Analyses

The following sections discuss the Project's impacts upon commercial, residential, and industrial growth, as well as vegetation and soils, and the nearest Federal Class I area.

5.1 Commercial, Residential, and Industrial Growth

The Project is to be located at the existing Kennedy Generating Station (KGS) in Jacksonville, Duval County, Florida. Because the Project is being installed to meet the existing and current projected electrical demands of the surrounding area, it is anticipated that little growth will be associated with its operation. There will be an increase in the local labor force during the construction phase of the Project, but this increase will be temporary, short-lived, and will not result in permanent/significant commercial and residential growth occurring in the vicinity of the project.

The electrical generating capacity created by the Project will not have a significant effect upon the industrial growth in the immediate area, considering that the electrical generating capacity will be sold to the grid as opposed to a nearby industrial host.

Population increase is a secondary growth indicator of potential increases in air quality levels. Changes in air quality due to population increase are related to the amount of vehicle traffic, commercial/institutional facilities, and home fuel use. According to the US Census Bureau, the population of Duval County has grown by 15.7 percent between the 1990 and 2000 censuses. In line with the population growth, the net number of new, permanent jobs which will be created by the Project is estimated to be little to none. It can be concluded that the air quality impacts associated with secondary growth will not be significant because the increase in population due to the operation of the Project will be very small, compared to the overall existing population size of the surrounding area.

5.2 Vegetation and Soils

Combustion turbine projects are typically considered "clean facilities" that have very low predicted ground level pollutant impacts. The low predicted impacts are the direct result of complete combustion and very effective pollutant dispersion. Dispersion is enhanced by the thermal and momentum buoyancy characteristics of the combustion turbine exhaust. Therefore, the Project's impacts on soils and vegetation will be minimal.

The AAQS were established to protect public health and welfare from any adverse effects of air pollutants. The definition of public welfare also encompasses vegetation and soils. Specifically, and as indicated in the *Draft New Source Review Workshop Manual* (EPA, 1990), ambient concentrations PM/PM_{10} below the secondary AAQS will not result in harmful effects for most types of soils and vegetation.

The criteria pollutant which triggered an additional impact analysis is PM/PM_{10}. The modeled impacts were compared to the secondary AAQS as the basis for assessing impacts. It can be inferred from the modeling in Section 4.0 that the PM/PM_{10} impacts are below the AAQS. The impacts are even less than the much lower significant impact level thresholds. Because the Project's emissions do not significantly impact the AAQS, it is reasonable to conclude that no adverse effects on soils and vegetation will occur.

5.3 Class I Area Impact Analysis

As part of the air impact evaluation for the Project, analyses of the Project's effect on the Okefenokee Wilderness Area (OWA), the Wolf Island Wilderness Area (WIWA), the Chassahowitzka Wilderness Area (CWA), and the Saint Marks Wilderness Area (SMWA) were performed. The OWA is the closest PSD Class I area located in southern Georgia, approximately 55 km northwest of the Project site. The other PSD Class I areas are located approximately 110 km, 203 km, and 227 km, respectively away from the Project site. Federal Class I areas are afforded special environmental protection through the use of Air Quality Related Values (AQRVs). The AQRVs of interest in this analysis are regional haze. Additionally, Class I Significant Impact Levels (SILs) were evaluated and compared to the recommended thresholds. Figure 5-1 presents the location of the Project site with respect to OWA, WIWA, CWA, and SMWA.

The methodology of the California Puff (CALPUFF) analysis followed those procedures recommended in the *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II* report dated December 1998 and the *Phase I Federal Land Managers' Air Quality Related Values Workgroup (FLAG)* report dated December 2000 and an air dispersion modeling protocol sent to FDEP. The following sections include discussions of the air modeling approach to assess impacts at OWA, WIWA, CWA, and SMWA as well as the model-predicted impacts from the Project onto the Class I Areas.

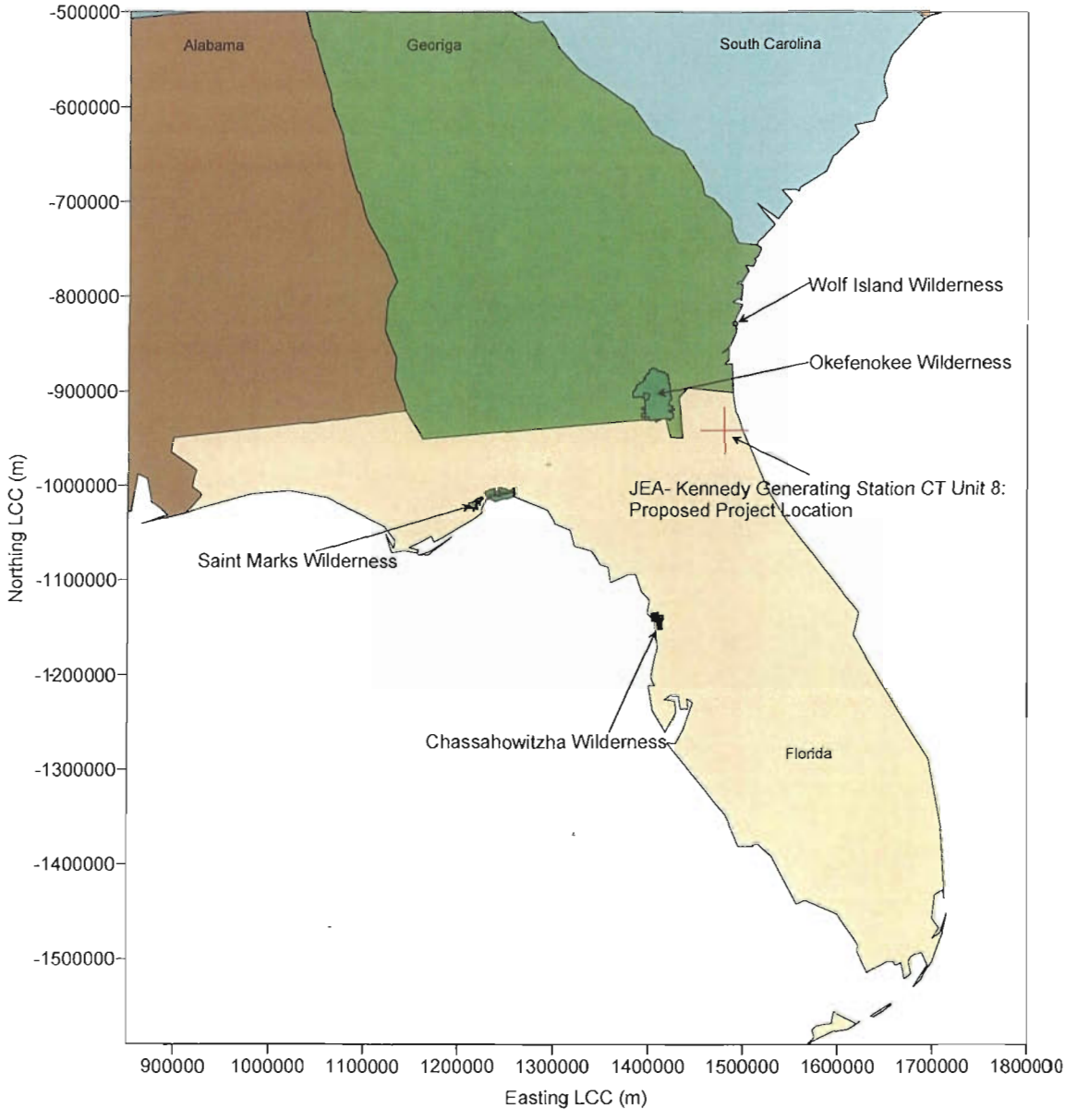


Figure 5-1
Project Location with Respect to the Class I Areas

5.3.1 Model Selection

The CALPUFF (Version 5.754A, Level 060202) air modeling system was used to model the Project and assess the AQRVs at OWA, WIWA, CWA, SMWA. CALPUFF is a non-steady state Lagrangian Gaussian puff long-range transport model that includes algorithms for building downwash effects as well as chemical transformations (important for visibility controlling pollutants), and wet/dry deposition. The CALMET model (Version 5.724, Level 060414), a preprocessor to CALPUFF, is a diagnostic meteorological model that produces three-dimensional fields of wind and temperature and two-dimensional fields of other meteorological parameters. CALMET was designed to process raw meteorological, terrain, and land-use databases to be used in the air modeling analysis. However, VISTAS, the Regional Planning Organization responsible for assisting with regional haze issues in the southeast, contracted Earth Tech, Inc. to produce CALPUFF ready, CALMET meteorological data files, thus bypassing the need to run the resources intensive CALMET processor. VISTAS has provided 2001-2003 CALMET files for five 4-km sub-regional domains as illustrated in Figure 5-2. For this Project CALMET files prepared for sub-domain 2 were used.

5.3.2 CALPUFF Model Settings

The CALPUFF settings contained in Table 5-1 were used for the modeling analyses.

5.3.3 Building Wake Effects

The CALPUFF analysis included the facility's building dimensions to account for the effects of building-induced downwash on the emission sources. Dimensions for all significant building structures were processed with the Building Profile Input Program (BPIPPRM), Version 04274, and included in the CALPUFF model input.

5.3.4 Receptor Locations

The CALPUFF analyses used an array of discrete Cartesian receptors over each Class I area, which were created and distributed by the NPS. Specifically, the array consists of receptors spaced to cover the extent of the Class I areas. Receptor elevations are included in the same NPS- provided receptor files.

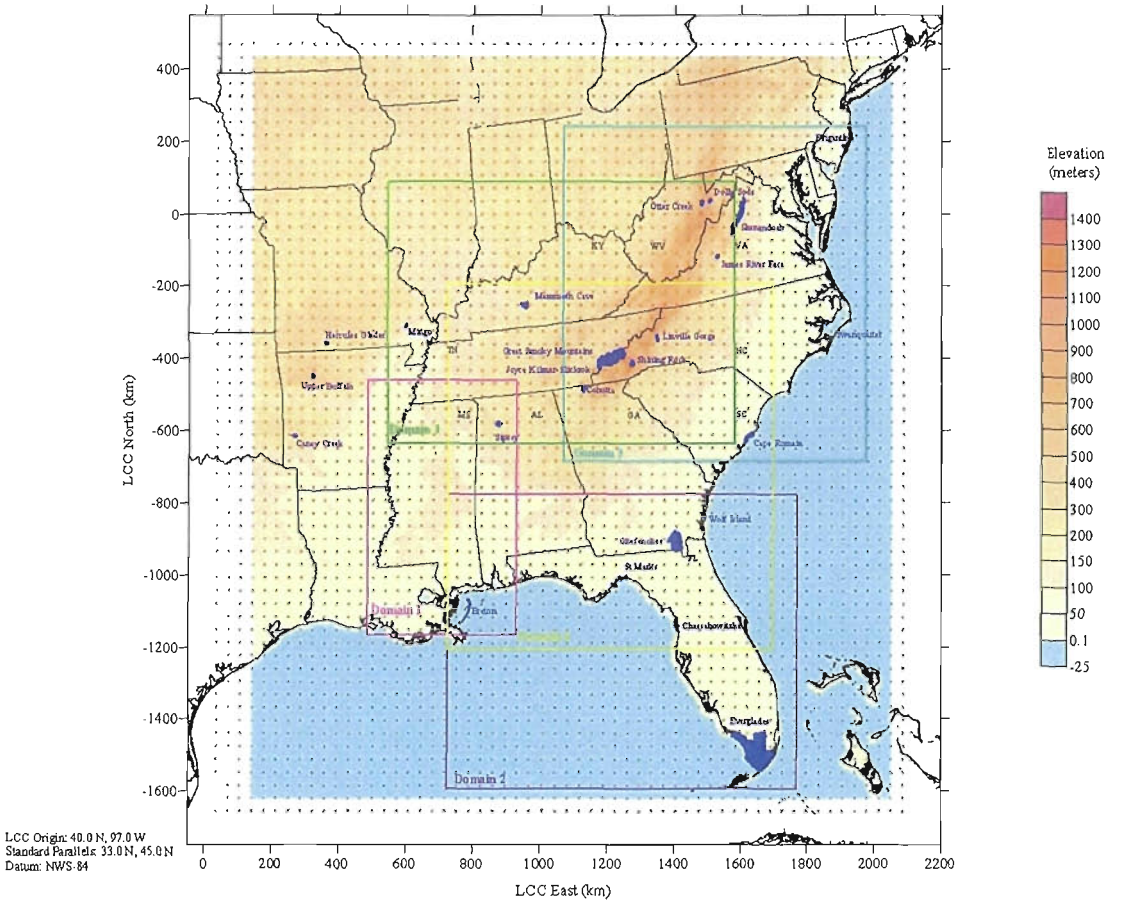


Figure 5-2
VISTAS 4-km CALMET Sub domains

Table 5-1

CALPUFF Model Settings

Parameter	Setting
Pollutant Species	PM_{10}
Chemical Transformation	MESOPUFF II scheme
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	VISTAS CALMET Files
Plume Rise	Transitional plume rise, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG/MP coefficients, rural ISC mode, PRIME building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration including output species for the pollutant.
Model Processing	Regional Haze: Highest predicted 24-hour change as processed by CALPOST. Class I SILs: Highest predicted concentrations at the applicable averaging periods for those pollutants that exceed the respective PSD Significant Emission Rates (SERs).
Background Values	Monthly Ammonia: 0.5 ppb; Hourly ozone data for 2001 through 2003 were obtained from standard ozone data files available on the VISTAS CALPUFF page (www.src.com/verio/download/sample_files.htm). A utility provided in the VISTAS version of the CALPRO software called SUBDOMN was used to extract ozone data from stations in the computational domain. In addition, monthly average ozone (backup) background values were calculated based on the daytime (6am-6pm) average ozone concentrations within the OZONE.dat files and entered into the model.

5.3.5 Modeling Domain.

The size of the domain used for the modeling was based on recommendations found in the guidance document *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II,* dated December 1998. Specifically, the guidance document states that the domain should extend at least 50 km beyond the furthest Class I Area in each of the north, south, east, and west directions to allow for puffs to return to a Class I Area due to a recirculating wind pattern.

Since this is a refined modeling methodology the modeling domain will be a subset of the CALMET domain 2. The modeling analysis will be performed in the Lambert Conformal Conic (LCC) coordinate system with standard parallels of 33 and 45 degrees north latitude and reference latitude and longitude of 40.0 and 97.0 degrees, respectively. A rectangular modeling domain extending 384 km in the east-west (x) direction and 428 km in the north-south (y) direction was used for the refined modeling analysis. The southwest corner of the domain is located at 1,157.995 km Easting and -1,206 km Northing (LCC, World Geodetic System (WGS) 1984 coordinates). The grid resolution for the domain will be 4 km. A grid spacing of 4 km yields 96 grid cells in the x-direction and 107 grid cells in the y-direction. Figure 5-3 illustrates the size and location of the modeling domain.

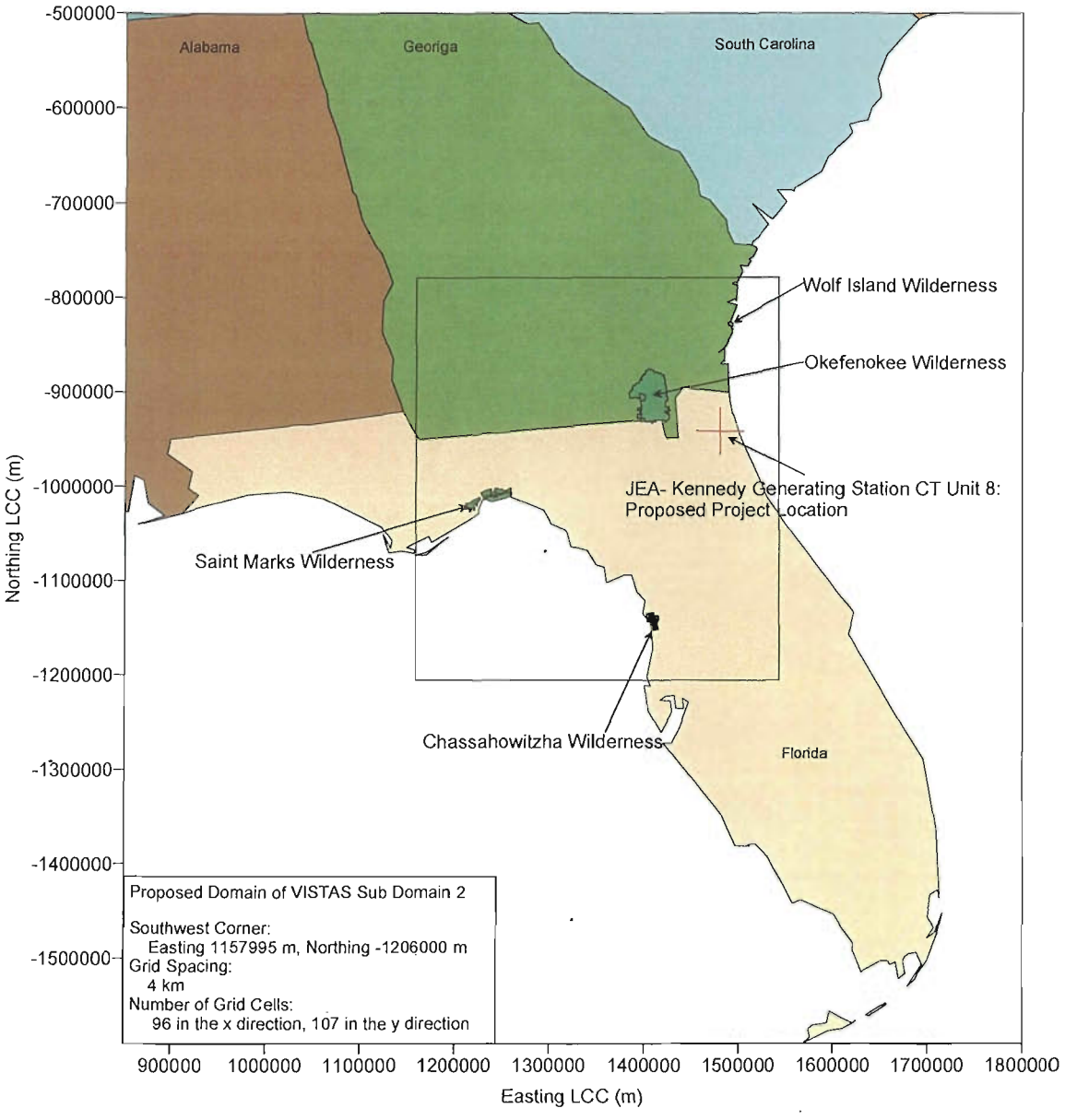


Figure 5-3
Modeling Domain

5.3.6 Meteorological Data

The meteorological data that was used in the CALPUFF model consisted of three years (2001-2003) of 4-km resolution VISTAS CALMET files from sub-domain 2 and consisted of meteorological and geophysical data for CALPUFF. These high resolution CALPUFF-ready, CALMET files were composed of available surface and upper air observations in addition to the highest resolution MM5 data available for each year (i.e., 12-km MM5 data for 2001 and 2002 and 36-km MM5 data for 2003).

5.3.7 Project Emissions

The worst-case representative stack parameters and pollutants emission rates at 100%, 75%, and 50% operating loads were used in the CALPUFF analyses. This was accomplished by representing the 100%, 75%, and 50% operating loads with a worst-case set of stack parameters and pollutant emission rates that were conservatively selected from performance data over a range of ambient temperatures (i.e., 7, 59, 68.8, and 105° F) to produce worst-case plume dispersion conditions (i.e., lowest exhaust temperature and exit velocity and the highest emission rate). This process is referred to as "enveloping".

The only pollutant subject to PSD and thus modeling was PM/PM_{10} (filterable and condensable). Table 5-2 contains the stack parameters and emission rates modeled in CALPUFF.

Table 5-2
Stack Parameters and Pollutant Emissions
Used in CALPUFF Modeling Analysis

Fuel[a]	Load	Stack Height (ft)	Stack Diameter (ft)	Exit Velocity (ft/s)	Exit Temp (°F)	Pollutant Emission Rate (lb/h) PM/PM_{10}[b]
NG	100	90	18	144.5	1,060	19
	75	90	18	124.1	1,118	19
	50	90	18	104.5	1,169	19
FO	100	90	18	150.2	1,094	45
	75	90	18	127.0	1,127	43
	50	90	18	107.9	1,175	41

[a]NG – Natural Gas, FO – Low Sulfur Fuel Oil.
[b]PM/PM_{10} represents both front and back half emissions.

5.3.8 CALPUFF Analyses

The preceding model inputs and settings for the CALPUFF modeling system were used to complete the Class I analyses on the OWA, WIWA, CWA, and SMWA, including regional haze and Class I SILs.

5.3.8.1 Regional Haze Analysis. A regional haze analysis was performed for the OWA, WIWA, CWA, and SMWA for particulate matter only. Recall, NO_x and SO_2 are not subject to PSD and, moreover, are projected to have a net decrease in emissions at the facility with the shut down of CT 3, 4, and 5, so they were not included in the Regional Haze Analysis.

Visibility

Visibility is an AQRV for the OWA, WIWA, CWA, and SMWA. Visibility can take the form of plume blight for nearby areas, or regional haze for long distances (e.g., distances beyond 50 km). Because all the Class I Areas lie beyond 50 km from the Project, the change in visibility is analyzed as regional haze. Regional haze impairs visibility in all directions over a large area by obscuring the clarity, color, texture, and form of what is seen. Current regional haze guidelines characterize a change in visibility by either of the following methods:

- Change in the visual range, defined as the greatest distance that a large dark object can be seen, or
- Change in the light-extinction coefficient (b_{ext}).

Visual range can be related to extinction with the following equation:

$$b_{ext}(Mm^{-1}) = 3912 / vr(Mm^{-1})$$

Visual range (vr) is a measure of how far away a large black object can be seen in the atmosphere under several severe assumptions including: an absolutely dark target, uniform lighting conditions (cloud free skies), uniform extinction in all directions, a limiting contrast discrimination level, a target high enough in elevation to account for earth curvature, and several other factors. Visual range is, at best, a limited concept that allows relatively simple comparisons between visual air quality levels and should not be thought of as the absolute distance that can be seen through the atmosphere.

The b_{ext} is the attenuation of light per unit distance due to the scattering (light reduced away from the site path) and absorption (light captured by aerosols and turned into heat energy) by gases and particles in the atmosphere. A change in the extinction

coefficient produces a perceived visual change that is measured by a visibility index called the deciview. The deciview (dv) is defined as:

$$dv = 10 \ln (1 + b_{exts} / b_{extb})$$

where:

b_{exts} = the extinction coefficient calculated for the source, and

b_{extb} = the background extinction coefficient

A uniform incremental change in b_{extb} or visual range does not necessarily result in uniform changes in perceived visual air quality. In fact, perceived changes in visibility are best related to a percent change in extinction. Based on NPS guidance, if the change in extinction is less than 5 percent, no further analysis is required. An index similar to the deciview that simply quantifies the percent change in visibility due to the operation of a source is calculated as:

$$\Delta \text{ percent} = (b_{exts} / b_{extb}) \times 100$$

Background Visual Ranges and Relative Humidity Factors

The background visual range and relative humidity factor were based on the relative humidity file produced in CALPUFF based from the CALMET meteorological files provided by VISTAS.

Regional Haze Methodology

The CALPUFF air modeling analysis closely followed the recommendations contained in the *IWAQM Phase II Summary Report and Recommendations for Modeling Long Range Transport Impacts*, (EPA, 12/98) where appropriate. Table 5-3 summarizes the IWAQM Phase II recommendations. The methodology in Table 5-3 for the most part was used to compute the results of the regional haze analysis (Recall that no nitrogen or sulfur emissions were modeled and the calculations will reflect that). However, CALPOST now possesses the ability to post-process the modeling results specific to the regional haze analysis through the selection of one of seven modeling options. The post-processing selection was made to calculate regional haze based on the appropriate available data/resources. Specifically, regional haze was calculated using Method 2, which consists of computing extinctions from speciated PM measurements using hourly relative humidity adjustments for observed and modeled sulfate and nitrates, which will be zero. The relative humidity will be capped at 95 percent. While this process occurs within CALPOST, a typical calculation methodology is illustrated below.

Table 5-3

Outline of IWAQM Refined Modeling Analyses Recommendations *

Meteorology	Use CALMET (minimum 6 to 10 layers in the vertical; top layer must extend above the maximum mixing depth expected); horizontal domain extends 50 to 80 km beyond outer receptors and source being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; NPS will provide the modeling receptors.
Dispersion	1. CALPUFF with default dispersion settings. 2. Use MESOPUFF II chemistry with wet and dry deposition 3. Define background values for ozone and ammonia for area
Processing	Use highest predicted 24-hr SO_4, PM_{10}, and NO_3 value; compute a day-average relative humidity factor (f(RH)) for the worst day for the predicted specie, calculate extinction coefficients and compute percent change in extinction using the FLAG supplied background extinction where appropriate. This can all now be accomplished with the use of Method 2 in the CALPOST post-processor.

* *IWAQM Phase II Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 12/98).

Calculation

Refined impacts will be calculated as follows:

1. Obtain 24 hour SO_4, NO_3, EC, OC, and SOIL impacts, in units of micrograms per cubic meter ($\mu g/m^3$).
2. Convert the SO_4 impact to $(NH_4)_2SO_4$ by the following formula:

   $(NH_4)_2SO_4$ ($\mu g/m3$) = SO_4 ($\mu g/m^3$) x molecular weight $(NH_4)_2SO_4$ / molecular weight SO_4

   $(NH_4)_2SO_4$ ($\mu g/m^3$) = SO_4 ($\mu g/m^3$) x 132/96 = SO_4 ($\mu g/m^3$) x 1.375

   Convert the NO_3 impact to NH_4NO_3 by the following formula:

   NH_4NO_3 ($\mu g/m3$) = NO_3 ($\mu g/m^3$) x molecular weight NH_4NO_3 / molecular weight NO_3

   NH_4NO_3 ($\mu g/m^3$) = NO_3 ($\mu g/m^3$) x 80/62 = NO_3 ($\mu g/m^3$) x 1.29
3. Compute b_{exts} (extinction coefficient calculated for the source) with the following formula:

   b_{exts} = 3 x NH_4NO_3 x f(RH) + 3 x $(NH_4)_2SO_4$ x f(RH) + 10 x EC + 4 x OC + 1 x SOIL
4. Compute b_{extb} (background extinction coefficient) using the background visual range (km) from the FLAG document with the following formula:

   b_{extb} = 3.912 / Visual range (km)
5. Compute the change in extinction coefficients:

in terms of deciviews:

$$dv = 10 \ln (1 + b_{exts} / b_{extb})$$

in terms of percent change of visibility:

$$\Delta \text{ percent} = (b_{exts} / b_{extb}) \times 100$$

Based on the predicted PM_{10} concentration, the Project's emissions were compared to a 5 percent change in light extinction of the background levels. This is equivalent to a change in deciview of 0.5. As illustrated in Table 5-4, the regional haze results, reported as the maximum value occurring anywhere on the respective receptor grid for each Class I area, are less than the 5 percent change in extinction threshold for OWA, WIWA, CWA, and SMWA and, as such, no further analysis is necessary.

Table 5-4
Regional Haze Results

Class I Area	Change in Extinction[a] (%)		Recommended Threshold (%)
	Natural Gas	Fuel Oil	
Okefenokee WA	0.16	0.35	5
Wolf Island WA	0.06	0.13	5
Chassahowitzka WA	0.03	0.08	5
Saint Marks WA	0.04	0.08	5

[a]Change in extinction was computed in CALPOST from the background concentration computed in CALPUFF.

5.3.8.2 Class I Impact Analysis. Ground-level impacts (in $\mu g/m^3$) at the OWA, WIWA, CWA, and SMWA were calculated for PM/PM_{10} for each applicable averaging period. The results of this analysis were compared with the Class I Significant Impact Levels (SILs) calculated as 4 percent of the Class I Increment values. Table 5-5 presents the maximum results of the Class I analysis for the 3 year period that was modeled. As illustrated in the table, there are no impacts above the Class I SILs at the OWA, WIWA, CWA, or SMWA and, as such, no further analysis is necessary.

Table 5-5
Class I Significant Impact Levels (SIL) Modeling Results

Pollutant	Averaging Period	Model-Predicted Impact[a] ($\mu g/m^3$)		PSD Class I SIL[b] ($\mu g/m^3$)	Exceed SIL?
		Natural Gas	Fuel Oil		
Okefenokee Wilderness Area					
PM/PM_{10}	Annual	0.002	0.004	0.16	NO
	24 Hour	0.039	0.087	0.32	NO
Wolf Island Wilderness Area					
PM/PM_{10}	Annual	0.0008	0.002	0.16	NO
	24 Hour	0.013	0.028	0.32	NO
Chassahowitzka Wilderness Area					
PM/PM_{10}	Annual	0.0002	0.0005	0.16	NO
	24 Hour	0.007	0.015	0.32	NO
Saint Marks Wilderness Area					
PM/PM_{10}	Annual	0.0004	0.0009	0.16	NO
	24 Hour	0.009	0.019	0.32	NO

[a]Model-predicted impacts are for the 3 year period that was in the analysis: 2001, 2002, 2003.
[b]Class I Significant Impact Levels are calculated as 4 percent of the PSD Class I Increment values.

JEA
KGS CT8 Project
Historical NO_x Emissions from CT3, CT4, and CT5 used in the netting analysis

Prepared by Black & Veatch

Basis:
Use of USEPA AP-42 Emission factor found in Section 3.1, Table 3.1-1
EF = 0.88 lb/mmBtu
Historical monthly unit heat input provided by JEA

		CT3 Heat Input (mmBtu)	CT3 NO_x Emissions (tons)	CT4 Heat Input (mmBtu)	CT4 NO_x Emissions (tons)	CT5 Heat Input (mmBtu)	CT5 NO_x Emissions (tons)	Sum of Monthly NO_x Emissions (tons)	24-Month Average Annual NO_x Emissions (tons/year)
1996	July	108	0.0	175	0.1	323	0.1	0.3	
	Aug	62	0.0	419	0.2	204	0.1	0.3	
	Sept	96	0.0	413	0.2	141	0.1	0.3	
	Oct	0	0.0	0	0.0	0	0.0	0.0	
	Nov	311	0.1	577	0.3	158	0.1	0.5	
	Dec	3,769	1.7	4,607	2.0	5,110	2.2	5.9	
1997	Jan	1,998	0.9	0	0.0	28	0.0	0.9	
	Feb	119	0.1	136	0.1	136	0.1	0.2	
	Mar	283	0.1	843	0.4	260	0.1	0.6	
	Apr	192	0.1	0	0.0	170	0.1	0.2	
	May	147	0.1	5,286	2.3	153	0.1	2.5	
	June	430	0.2	204	0.1	351	0.2	0.4	
	July	7,755	3.4	10,598	4.7	5,178	2.3	10.4	
	Aug	5,006	2.2	485	0.2	83	0.0	2.5	
	Sept	0	0.0	0	0.0	1,424	0.6	0.6	
	Oct	4,782	2.1	1,052	0.5	0	0.0	2.6	
	Nov	0	0.0	0	0.0	0	0.0	0.0	
	Dec	745	0.3	1,153	0.5	3,765	1.7	2.5	
1998	Jan	0	0.0	0	0.0	496	0.2	0.2	
	Feb	177	0.1	219	0.1	1,206	0.5	0.7	
	Mar	3,857	1.7	4,157	1.8	3,928	1.7	5.3	
	Apr	1,082	0.5	1,435	0.6	941	0.4	1.5	
	May	23,832	10.5	28,435	12.5	24,646	10.8	33.8	
	June	79,247	34.9	87,466	38.5	80,694	35.5	108.9	90.4
	July	62,923	27.7	62,285	27.4	52,343	23.0	78.1	129.4
	Aug	45,048	19.8	46,398	20.4	30,741	13.5	53.8	156.1
	Sept	15,885	7.0	12,294	5.4	11,679	5.1	17.5	164.7
	Oct	2,539	1.1	0	0.0	0	0.0	1.1	165.3
	Nov	1,833	0.8	2,114	0.9	2,329	1.0	2.8	166.4
	Dec	4,157	1.8	4,983	2.2	3,107	1.4	5.4	166.2
1999	Jan	17,356	7.6	16,705	7.4	11,003	4.8	19.8	175.6
	Feb	1,115	0.5	199	0.1	614	0.3	0.8	176.0
	Mar	3,990	1.8	0	0.0	171	0.1	1.8	176.6
	Apr	29,918	13.2	0	0.0	31,846	14.0	27.2	190.1
	May	2,356	1.0	0	0.0	3,908	1.7	2.8	190.2
	June	13,458	5.9	3,785	1.7	9,686	4.3	11.8	195.9
	July	84,473	37.2	69,285	30.5	90,544	39.8	107.5	244.5
	Aug	74,253	32.7	64,232	28.3	78,255	34.4	95.4	291.0
	Sept	11,722	5.2	12,706	5.6	3,639	1.7	12.4	296.9
	Oct	24,238	10.7	22,568	9.9	0	0.0	20.6	305.9
	Nov	1,235	0.5	3,234	1.4	0	0.0	2.0	306.9
	Dec	7,822	3.4	14,927	6.6	1,304	0.6	10.6	310.9
2000	Jan	4,160	1.8	9,739	4.3	12,039	5.3	11.4	316.5
	Feb	2,898	1.3	3,036	1.3	3,302	1.5	4.1	318.2
	Mar	0	0.0	0	0.0	0	0.0	0.0	315.6
	Apr	2,787	1.2	1,459	0.6	1,657	0.7	2.6	316.1
	May	39,815	17.5	33,708	14.8	38,801	17.1	49.4	323.9
	June	19,215	8.5	23,088	10.2	17,202	7.6	26.2	282.5
	July	55,858	24.6	53,302	23.5	53,367	23.5	71.5	279.2
	Aug	33,305	14.7	43,943	19.3	42,138	18.5	52.5	278.6
	Sept	27,329	12.0	25,634	11.3	23,945	10.5	33.8	286.8
	Oct	20,971	9.2	26,083	11.5	20,575	9.1	29.8	301.1
	Nov	3,979	1.8	6,888	3.0	6,136	2.7	7.5	303.5
	Dec	66,417	29.2	88,015	38.7	92,821	40.8	108.6	355.2

		CT3 Heat Input (mmBtu)	CT3 NO_x Emissions (tons)	CT4 Heat Input (mmBtu)	CT4 NO_x Emissions (tons)	CT5 Heat Input (mmBtu)	CT5 NO_x Emissions (tons)	Sum of Monthly NO_x Emissions (tons)	24-Month Average Annual NO_x Emissions (tons/year)
2001	Jan	32,355	14.2	33,674	14.8	37,761	16.6	45.7	368.1
	Feb	3,150	1.4	3,508	1.5	2,979	1.3	4.2	369.8
	Mar	0	0.0	5,931	2.6	5,147	2.3	4.9	371.3
	Apr	0	0.0	8,982	4.0	9,476	4.2	8.1	361.8
	May	0	0.0	12,820	5.6	10,948	4.8	10.5	365.6
	June	1,435	0.6	4,872	2.1	13,965	6.1	8.8	364.1
	July	17,165	7.6	20,697	9.1	7,495	3.3	20.0	320.3
	Aug	43,063	18.9	22,596	9.9	19,361	8.5	37.4	291.4
	Sept	2,753	1.2	1,932	0.9	202	0.1	2.2	286.2
	Oct	0	0.0	0	0.0	0	0.0	0.0	275.9
	Nov	1,560	0.7	968	0.4	1,050	0.5	1.6	275.7
	Dec	2,421	1.1	2,099	0.9	314	0.1	2.1	271.5
2002	Jan	24,316	10.7	24,514	10.8	24,399	10.7	32.2	281.9
	Feb	3,632	1.6	3,001	1.3	3,010	1.3	4.2	282.0
	Mar	12,650	5.6	7,154	3.1	10,993	4.8	13.6	288.8
	Apr	32,109	14.1	29,698	13.1	15,857	7.0	34.2	304.6
	May	58,769	25.9	50,316	22.1	2,144	0.9	48.9	304.3
	June	1,246	0.5	22,117	9.7	0	0.0	10.3	296.4
	July	851	0.4	5,327	2.3	3,113	1.4	4.1	262.7
	Aug	0	0.0	0	0.0	0	0.0	0.0	236.4
	Sept	14,409	6.3	11,049	4.9	12,927	5.7	16.9	227.9
	Oct	14,611	6.4	12,477	5.5	13,760	6.1	18.0	222.0
	Nov	0	0.0	0	0.0	0	0.0	0.0	218.3
	Dec	469	0.2	3,256	1.4	1,829	0.8	2.4	165.1
2003	Jan	14,849	6.5	8,651	3.8	19,157	8.4	18.8	151.7
	Feb	3,218	1.4	1,294	0.6	2,434	1.1	3.1	151.1
	Mar	0	0.0	0	0.0	0	0.0	0.0	148.6
	Apr	0	0.0	0	0.0	0	0.0	0.0	144.6
	May	29,346	12.9	24,734	10.9	7,185	3.2	27.0	152.8
	June	0	0.0	0	0.0	1,505	0.7	0.7	148.7
	July	914	0.4	1,935	0.9	513	0.2	1.5	139.5
	Aug	0	0.0	4,216	1.9	1,987	0.9	2.7	122.2
	Sept	251	0.1	262	0.1	0	0.0	0.2	121.2
	Oct	232	0.1	169	0.1	257	0.1	0.3	121.3
	Nov	144	0.1	631	0.3	136	0.1	0.4	120.7
	Dec	90	0.0	0	0.0	917	0.4	0.4	119.9
2004	Jan	4,304	1.9	4,272	1.9	4,579	2.0	5.8	106.7
	Feb	204	0.1	678	0.3	1,085	0.5	0.9	105.0
	Mar	0	0.0	0	0.0	0	0.0	0.0	98.2
	Apr	39	0.0	0	0.0	0	0.0	0.0	81.1
	May	134	0.1	2,337	1.0	2,281	1.0	2.1	57.7
	June	180	0.1	0	0.0	1,440	0.6	0.7	52.9
	July	7,716	3.4	10,537	4.6	9,005	4.0	12.0	56.9
	Aug	629	0.3	1,062	0.5	0	0.0	0.7	57.3
	Sept	504	0.2	0	0.0	986	0.4	0.7	49.1
	Oct	1,494	0.7	0	0.0	1,474	0.6	1.3	40.8
	Nov	0	0.0	0	0.0	0	0.0	0.0	40.8
	Dec	376	0.2	0	0.0	128	0.1	0.2	39.7

JEA
KGS CT8 Project
Historical SO_2 Emissions from CT3, CT4, and CT5 used in the netting analysis

Prepared by Black & Veatch

Basis:
Use of USEPA AP-42 Emission factor found in Section 3.1, Table 3.1-2a
EF = 1.01S, where S = percent sulfur in fuel
Historical monthly unit heat input and fuel sulfur content provided by JEA

Year	Month	Fuel Sulfur Content (%)	CT3 Heat Input (mmBtu)	CT3 SO_2 Emissions (tons)	CT4 Heat Input (mmBtu)	CT4 SO_2 Emissions (tons)	CT5 Heat Input (mmBtu)	CT5 SO_2 Emissions (tons)	Sum of Monthly SO_2 Emissions (tons)	24-Month Average Annual SO_2 Emissions (tons/year)
1996	July		108		175		323		0.0	
	Aug		62		419		204		0.0	
	Sept		96		413		141		0.0	
	Oct		0		0		0		0.0	
	Nov		311		577		158		0.0	
	Dec		3,769		4,607		5,110		0.0	
1997	Jan		1,998		0		28		0.0	
	Feb		119		136		136		0.0	
	Mar		283		843		260		0.0	
	Apr		192		0		170		0.0	
	May		147		5,286		153		0.0	
	June		430		204		351		0.0	
	July		7,755		10,598		5,178		0.0	
	Aug		5,006		485		83		0.0	
	Sept		0		0		1,424		0.0	
	Oct		4,782		1,052		0		0.0	
	Nov		0		0		0		0.0	
	Dec		745		1,153		3,765		0.0	
1998	Jan	0.249	0	0.0	0	0.0	496	0.1	0.1	
	Feb	0.249	177	0.0	219	0.0	1,206	0.2	0.2	
	Mar	0.249	3,857	0.5	4,157	0.5	3,928	0.5	1.5	
	Apr	0.249	1,082	0.1	1,435	0.2	941	0.1	0.4	
	May	0.249	23,832	3.0	28,435	3.6	24,646	3.1	9.7	
	June	0.176	79,247	7.1	87,466	7.8	80,894	7.2	22.0	16.9
	July	0.272	62,923	8.6	62,285	8.5	52,343	7.2	24.4	29.1
	Aug	0.288	45,048	6.5	46,398	6.7	30,741	4.5	17.7	38.0
	Sept	0.286	15,885	2.3	12,294	1.8	11,679	1.7	5.8	40.9
	Oct	0.286	2,539	0.4	0	0.0	0	0.0	0.4	41.1
	Nov	0.287	1,833	0.3	2,114	0.3	2,329	0.3	0.9	41.5
	Dec	0.287	4,157	0.6	4,983	0.7	3,107	0.4	1.8	42.4
1999	Jan	0.287	17,356	2.5	16,705	2.4	11,003	1.6	6.5	45.7
	Feb	0.288	1,115	0.2	199	0.0	614	0.1	0.3	45.8
	Mar	0.288	3,990	0.6	0	0.0	171	0.0	0.6	46.1
	Apr	0.288	29,918	4.3	0	0.0	31,846	4.6	9.0	50.6
	May	0.287	2,356	0.3	0	0.0	3,908	0.6	0.9	51.0
	June	0.287	13,458	1.9	3,785	0.5	9,586	1.4	3.9	53.0
	July	0.280	84,473	12.0	69,285	9.8	90,544	12.8	34.6	70.3
	Aug	0.279	74,253	10.5	64,232	9.1	78,255	11.0	30.5	85.6
	Sept	0.281	11,722	1.7	12,706	1.8	3,839	0.5	4.0	87.6
	Oct	0.281	24,238	3.4	22,568	3.2	0	0.0	6.6	90.9
	Nov	0.220	1,235	0.1	3,234	0.4	0	0.0	0.5	91.1
	Dec	0.220	7,822	0.9	14,927	1.7	1,304	0.1	2.7	92.5
2000	Jan	0.220	4,160	0.5	9,739	1.1	12,039	1.3	2.9	93.9
	Feb	0.220	2,898	0.3	3,036	0.3	3,302	0.4	1.0	94.3
	Mar	0.220	0	0.0	0	0.0	0	0.0	0.0	93.5
	Apr	0.227	2,787	0.3	1,459	0.2	1,657	0.2	0.7	93.6
	May	0.178	39,815	3.6	33,708	3.0	38,801	3.5	10.1	93.9
	June	0.115	19,215	1.1	23,088	1.3	17,202	1.0	3.5	84.6
	July	0.035	55,858	1.0	53,302	0.9	53,367	0.9	2.8	73.8
	Aug	0.039	33,305	0.7	43,943	0.9	42,138	0.8	2.3	66.1
	Sept	0.039	27,329	0.5	25,634	0.5	23,945	0.5	1.5	64.0
	Oct	0.039	20,971	0.4	26,083	0.5	20,575	0.4	1.3	64.5
	Nov	0.039	3,979	0.1	6,888	0.1	6,136	0.1	0.3	64.2
	Dec	0.039	66,417	1.3	88,015	1.7	92,821	1.8	4.9	65.8

Year	Month	Fuel Sulfur Content (%)	CT3 Heat Input (mmBtu)	CT3 SO_2 Emissions (tons)	CT4 Heat Input (mmBtu)	CT4 SO_2 Emissions (tons)	CT5 Heat Input (mmBtu)	CT5 SO_2 Emissions (tons)	Sum of Monthly SO_2 Emissions (tons)	24-Month Average Annual SO_2 Emissions (tons/year)
2001	Jan	0.046	32,355	0.8	33,674	0.8	37,761	0.9	2.4	63.7
	Feb	0.046	3,150	0.1	3,508	0.1	2,979	0.1	0.2	63.7
	Mar	0.046	0	0.0	5,931	0.1	5,147	0.1	0.3	63.5
	Apr	0.048	0	0.0	8,982	0.2	9,476	0.2	0.4	59.2
	May	0.049	0	0.0	12,820	0.3	10,948	0.3	0.6	59.1
	June	0.049	1,435	0.0	4,672	0.1	13,965	0.3	0.5	57.4
	July	0.047	17,165	0.4	20,697	0.5	7,495	0.2	1.1	40.6
	Aug	0.048	43,063	1.0	22,596	0.5	19,361	0.5	2.0	26.4
	Sept	0.048	2,753	0.1	1,932	0.0	202	0.0	0.1	24.4
	Oct	0.043	0	0.0	0	0.0	0	0.0	0.0	21.1
	Nov	0.042	1,560	0.0	968	0.0	1,050	0.0	0.1	20.9
	Dec	0.040	2,421	0.0	2,099	0.0	314	0.0	0.1	19.6
2002	Jan	0.034	24,316	0.4	24,514	0.4	24,399	0.4	1.3	18.8
	Feb	0.034	3,632	0.1	3,001	0.1	3,010	0.1	0.2	18.4
	Mar	0.034	12,650	0.2	7,154	0.1	10,993	0.2	0.5	18.7
	Apr	0.034	32,109	0.6	29,698	0.5	15,857	0.3	1.3	19.0
	May	0.034	58,769	1.0	50,316	0.9	2,144	0.0	1.9	14.9
	June	0.034	1,246	0.0	22,117	0.4	0	0.0	0.4	13.4
	July	0.042	851	0.0	5,327	0.1	3,113	0.1	0.2	12.0
	Aug	0.039	0	0.0	0	0.0	0	0.0	0.0	10.9
	Sept	0.040	14,409	0.3	11,049	0.2	12,927	0.3	0.8	10.5
	Oct	0.044	14,611	0.3	12,477	0.3	13,760	0.3	0.9	10.3
	Nov	0.044	0	0.0	0	0.0	0	0.0	0.0	10.1
	Dec	0.046	469	0.0	3,256	0.1	1,829	0.0	0.1	7.7
2003	Jan	0.040	14,849	0.3	8,651	0.2	19,157	0.4	0.9	7.0
	Feb	0.037	3,218	0.1	1,294	0.0	2,434	0.0	0.1	6.9
	Mar	0.037	0	0.0	0	0.0	0	0.0	0.0	6.8
	Apr	0.038	0	0.0	0	0.0	0	0.0	0.0	6.6
	May	0.034	29,346	0.5	24,734	0.4	7,185	0.1	1.0	6.8
	June	0.030	0	0.0	0	0.0	1,505	0.0	0.0	6.6
	July	0.036	914	0.0	1,935	0.0	513	0.0	0.1	6.0
	Aug	0.036	0	0.0	4,216	0.1	1,987	0.0	0.1	5.1
	Sept	0.036	251	0.0	262	0.0	0	0.0	0.0	5.0
	Oct	0.035	232	0.0	169	0.0	257	0.0	0.0	5.0
	Nov	0.035	144	0.0	631	0.0	136	0.0	0.0	5.0
	Dec	0.035	90	0.0	0	0.0	917	0.0	0.0	5.0
2004	Jan	0.030	4,304	0.1	4,272	0.1	4,579	0.1	0.2	4.4
	Feb	0.030	204	0.0	678	0.0	1,085	0.0	0.0	4.4
	Mar	0.030	0	0.0	0	0.0	0	0.0	0.0	4.1
	Apr	0.030	39	0.0	0	0.0	0	0.0	0.0	3.4
	May	0.030	134	0.0	2,337	0.0	2,281	0.0	0.1	2.5
	June	0.030	180	0.0	0	0.0	1,440	0.0	0.0	2.3
	July	0.030	7,716	0.1	10,537	0.2	9,005	0.1	0.4	2.4
	Aug	0.030	629	0.0	1,062	0.0	0	0.0	0.0	2.4
	Sept	0.030	504	0.0	0	0.0	986	0.0	0.0	2.1
	Oct	0.030	1,494	0.0	0	0.0	1,474	0.0	0.0	1.6
	Nov	0.030	0	0.0	0	0.0	0	0.0	0.0	1.6
	Dec	0.030	376	0.0	0	0.0	128	0.0	0.0	1.6

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates
HAP emissions for existing CT7

Prepared by: Black & Veatch

FUEL:	DISTILLATE OIL
HEAT INPUT (MMBtu/hr):	[illegible]
HOURS OF OPERATION:	[illegible]
NUMBER OF TURBINES	[illegible]

DISTILLATE OIL FIRED TURBINE EMISSIONS

Pollutant	Emission factor[1] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
1,3 Butadiene	1.60E-05	2.92E-02	0.018
Benzene	5.50E-05	1.00E-01	0.063
Formaldehyde	2.80E-04	5.10E-01	0.321
Naphthalene	3.50E-05	6.38E-02	0.040
PAH	4.00E-05	7.29E-02	0.046
		Total Organic HAP Emissions (tpy)	0.489

DISTILLATE OIL FIRED TURBINE METALLIC HAP EMISSIONS

Pollutant	Emission factor[2] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
Arsenic	1.10E-05	2.00E-02	0.013
Beryllium	3.10E-07	5.65E-04	0.000
Cadmium	4.80E-06	8.75E-03	0.006
Chromium	1.10E-05	2.00E-02	0.013
Lead	1.40E-05	2.55E-02	0.016
Manganese	7.90E-04	1.44E+00	0.907
Mercury	1.20E-06	2.19E-03	0.001
Nickel	4.60E-06	8.38E-03	0.005
Selenium	2.50E-05	4.56E-02	0.029
		Total Metallic HAP Emissions (tpy)	0.989

[1] Emission factors from AP-42 Section 3.1 Table 3.1-4.
[2] Emission factors from AP-42 Section 3.1 Table 3.1-5.
Heat Input rate is at 100% load and average site ambient temperatures.

Summary of HAP Emissions

Pollutant	Emissions (tons per year)
1,3 Butadiene	0.018
Benzene	0.063
Formaldehyde	0.321
Naphthalene	0.040
PAH	0.046
Arsenic	0.013
Beryllium	0.000
Cadmium	0.006
Chromium	0.013
Lead	0.016
Manganese	0.907
Mercury	0.001
Nickel	0.005
Selenium	0.029
Total HAPs	1.478

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates
HAP emissions for existing CT7

Prepared by: Black & Veatch

FUEL:	NATURAL GAS
HEAT INPUT (MMBtu/hr):	1624
HOURS OF OPERATION:	4050
NUMBER OF TURBINES	1

NATURAL GAS FIRED TURBINE ORGANIC HAP EMISSIONS

Pollutant	Emission factor[1] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
1,3 Butadiene	4.30E-07	6.98E-04	0.001
Acetaldehyde	4.00E-05	6.49E-02	0.131
Acrolein	6.40E-06	1.04E-02	0.021
Benzene	1.20E-05	1.95E-02	0.039
Ethylbenzene	3.20E-05	5.19E-02	0.105
Formaldehyde	7.10E-04	1.15E+00	2.333
Naphthalene	1.30E-06	2.11E-03	0.004
PAH	2.20E-06	3.57E-03	0.007
Propylene Oxide	2.90E-05	4.71E-02	0.095
Toluene	1.30E-04	2.11E-01	0.427
Xylenes	6.40E-05	1.04E-01	0.210
		Total Organic HAP Emissions (tpy)	3.376

[1] Emission factors from AP-42 Section 3.1 Table 3.1-3.
Heat Input rate is at 100% load and 36F site ambient temperatures.

Summary of HAP Emissions	
Pollutant	**Emissions (tons per year)**
1,3 Butadiene	0.001
Acetaldehyde	0.131
Acrolein	0.021
Benzene	0.039
Ethylbenzene	0.105
Formaldehyde	2.333
Naphthalene	0.004
PAH	0.007
Propylene Oxide	0.095
Toluene	0.427
Xylenes	0.210
Total HAPs	3.376

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates
HAP emissions for CT8

Prepared by: Black & Veatch

FUEL:	DISTILLATE OIL
HEAT INPUT (MMBtu/hr):	1669.5
HOURS OF OPERATION:	2000
NUMBER OF TURBINES	

DISTILLATE OIL FIRED TURBINE EMISSIONS

Pollutant	Emission factor[1] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
1,3 Butadiene	1.60E-05	3.18E-02	0.013
Benzene	5.50E-05	1.09E-01	0.044
Formaldehyde	2.80E-04	5.57E-01	0.223
Naphthalene	3.50E-05	6.96E-02	0.028
PAH	4.00E-05	7.96E-02	0.032
		Total Organic HAP Emissions (tpy)	0.339

DISTILLATE OIL FIRED TURBINE METALLIC HAP EMISSIONS

Pollutant	Emission factor[2] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
Arsenic	1.10E-05	2.19E-02	0.009
Beryllium	3.10E-07	6.17E-04	0.000
Cadmium	4.80E-06	9.55E-03	0.004
Chromium	1.10E-05	2.19E-02	0.009
Lead	1.40E-05	2.79E-02	0.011
Manganese	7.90E-04	1.57E+00	0.629
Mercury	1.20E-06	2.39E-03	0.001
Nickel	4.60E-06	9.15E-03	0.004
Selenium	2.50E-05	4.97E-02	0.020
		Total Metallic HAP Emissions (tpy)	0.686

[1] Emission factors from AP-42 Section 3.1 Table 3.1-4.
[2] Emission factors from AP-42 Section 3.1 Table 3.1-5.
Heat Input rate is at 100% load and average site ambient temperatures.

Summary of HAP Emissions

Pollutant	Emissions (tons per year)
1,3 Butadiene	0.013
Benzene	0.044
Formaldehyde	0.223
Naphthalene	0.028
PAH	0.032
Arsenic	0.009
Beryllium	0.000
Cadmium	0.004
Chromium	0.009
Lead	0.011
Manganese	0.629
Mercury	0.001
Nickel	0.004
Selenium	0.020
Total HAPs	1.025

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates
HAP emissions for new CT8

Prepared by: Black & Veatch

FUEL:	NATURAL GAS
HEAT INPUT (MMBtu/hr):	1804
HOURS OF OPERATION:	5000
NUMBER OF TURBINES	1

NATURAL GAS FIRED TURBINE ORGANIC HAP EMISSIONS

Pollutant	Emission factor[1] lb/MMBtu	Emissions lb/hr/turbine	Emissions tons/yr
1,3 Butadiene	4.30E-07	7.76E-04	0.002
Acetaldehyde	4.00E-05	7.22E-02	0.180
Acrolein	6.40E-06	1.15E-02	0.029
Benzene	1.20E-05	2.16E-02	0.054
Ethylbenzene	3.20E-05	5.77E-02	0.144
Formaldehyde	7.10E-04	1.28E+00	3.202
Naphthalene	1.30E-06	2.35E-03	0.006
PAH	2.20E-06	3.97E-03	0.010
Propylene Oxide	2.90E-05	5.23E-02	0.131
Toluene	1.30E-04	2.35E-01	0.586
Xylenes	6.40E-05	1.15E-01	0.289
		Total Organic HAP Emissions (tpy)	4.633

[1] Emission factors from AP-42 Section 3.1 Table 3.1-3.
Heat Input rate is at 100% load and 36F site ambient temperatures.

Summary of HAP Emissions

Pollutant	Emissions (tons per year)
1,3 Butadiene	0.002
Acetaldehyde	0.180
Acrolein	0.029
Benzene	0.054
Ethylbenzene	0.144
Formaldehyde	3.202
Naphthalene	0.006
PAH	0.010
Propylene Oxide	0.131
Toluene	0.586
Xylenes	0.289
Total HAPs	4.633

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates
HAP emissions for new CT8

Prepared by: Black & Veatch

Summary of HAP Emissions	
Pollutant	**Emissions (tons per year)**
1,3 Butadiene	0.014
Acetaldehyde	0.180
Acrolein	0.029
Benzene	0.089
Ethylbenzene	0.144
Formaldehyde	3.202
Naphthalene	0.033
PAH	0.040
Propylene Oxide	0.131
Toluene	0.586
Xylenes	0.289
Arsenic	0.009
Beryllium	0.000
Cadmium	0.004
Chromium	0.009
Lead	0.011
Manganese	0.629
Mercury	0.001
Nickel	0.004
Selenium	0.020
Total HAPs	4.917

JEA

KGS CT8 Project
145485
Hazardous Air Pollutant (HAP) Emission Estimates

Prepared by: Black & Veatch

Summary of HAP Emissions	
Pollutant	Emissions (tons per year)
1,3 Butadiene	0.033
Acetaldehyde	0.312
Acrolein	0.050
Benzene	0.152
Ethylbenzene	0.249
Formaldehyde	5.536
Naphthalene	0.073
PAH	0.086
Propylene Oxide	0.226
Toluene	1.014
Xylenes	0.499
Arsenic	0.021
Beryllium	0.001
Cadmium	0.009
Chromiuim	0.021
Lead	0.027
Manganese	1.535
Mercury	0.002
Nickel	0.009
Selenium	0.049
Total HAPs	8.293

(1) Maximum emissions for each pollutant are the worst case emission of that pollutant (between natural gas or fuel oil operation).

(2) Total HAP emissions are the maximum total HAP emissions from the combustion turbines based on the worst case operating scenario and do not equal the sum of the individual HAP emissions.

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for any air construction permit at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air permit. Also use this form to apply for an air construction permit:

- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- Where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- Where the applicant proposes to establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial/revised/renewal Title V air operation permit.

Air Construction Permit & Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: JEA
2. Site Name: Kennedy Generating Station
3. Facility Identification Number: 0310047
4. Facility Location...
   Street Address or Other Locator: 4215 Talleyrand Avenue
   City: Jacksonville County: Duval Zip Code: 32206
5. Relocatable Facility? ☐ Yes ☒ No
6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: N. Bert Gianazza, P.E.
2. Application Contact Mailing Address...
   Organization/Firm: JEA
   Street Address: 21 West Church Street
   City: Jacksonville State: FL Zip Code: 32202-3139
3. Application Contact Telephone Numbers...
   Telephone: (904) 665-6247 ext. Fax: (904) 665-7376
4. Application Contact Email Address: giannb@jea.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 12/22/06
2. Project Number(s): 0310047-015-AC
3. PSD Number (if applicable): PSD-FL-386
4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

[X] Air construction permit.

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

[ ] Initial Title V air operation permit.

[ ] Title V air operation permit revision.

[ ] Title V air operation permit renewal.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

[ ] Air construction permit and Title V permit revision, incorporating the proposed project.

[ ] Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

[ ] I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This is a construction permit application for installation of one General Electric 7FA simple cycle combustion turbine (CT8). The application requests an overall limit of 5,000 hours per year operation for the new CT8 and up to 800 hours per year of low sulfur fuel oil firing in the new CT8. Through these requested operating limits and a netting analysis that includes the permanent shutdown of CT3, CT4, and CT5 at the site, the project is subject to prevention of significant deterioration (PSD) permitting for only PM and PM_{10}. By this application, JEA is requesting that the construction permit for the new CT8 include a condition that requires permanent shutdown of existing CT3, CT4, and CT5 with the permanent shutdown date set as the date that new CT8 begins operation.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
	CT8 – GE 7FA Simple Cycle Combustion Turbine	AC1A	7,500.00

Application Processing Fee

Check one: [X] Attached - Amount: $7,500.00_____ [ ] Not Applicable

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Mr. James M. Chansler, P.E., D.P.A., Chief Operating Officer

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: JEA
   Street Address: 21 West Church Street
   City: Jacksonville State: FL Zip Code: 32202

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: (904) 665-4433 ext. Fax: (904) 665-7376

4. Owner/Authorized Representative Email Address:

5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.

James M. Chansler DW — Signature

13Dec06 — Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

   ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.

   ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.

   ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.

   ☐ The designated representative at an Acid Rain source.

3. Application Responsible Official Mailing Address...
   Organization/Firm:
   Street Address:
   City: State: Zip Code:

4. Application Responsible Official Telephone Numbers...
   Telephone: ext. Fax:

5. Application Responsible Official Email Address:

6. Application Responsible Official Certification:

   I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

   Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: N. Bert Gianazza
   Registration Number: 38640
2. Professional Engineer Mailing Address...
   Organization/Firm: JEA
   Street Address: 21 West Church Street
   City: Jacksonville State: FL Zip Code: 32202
3. Professional Engineer Telephone Numbers...
   Telephone: (904) 665-6247 ext. Fax: (904) 665-7376
4. Professional Engineer Email Address: giannb@jea.com
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here , if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature 12/13/06
Date

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 440.065 North (km) 3359.150		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 30/21/52 Longitude (DD/MM/SS) 81/37/25	
3. Governmental Facility Code: 4	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4911
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: N. Bert Gianazza, P.E. – Environmental Services
2. Facility Contact Mailing Address... Organization/Firm: JEA Street Address: 21 West Church Street City: Jacksonville State: FL Zip Code: 32202
3. Facility Contact Telephone Numbers: Telephone: (904) 665-6247 ext. Fax: (904) 665-7376
4. Facility Contact Email Address: giannb@jea.com

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official Email Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☐ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
NOX	A	N
CO	A	N
VOC	B	N
SO2	A	N
PM	A	N
PM10	A	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility Wide Cap [Y or N]? (all units)	3. Emissions Unit ID No.s Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. A [ ] Previously Submitted, Date:_____
2. Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. B [ ] Previously Submitted, Date:_____
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. C [ ] Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location:
   [ ] Attached, Document ID:_____ [X] Not Applicable (existing permitted facility)
2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL):
   [X] Attached, Document ID: Attach. D
3. Rule Applicability Analysis:
   [X] Attached, Document ID: Attach. E
4. List of Exempt Emissions Units (Rule 62-210.300(3), F.A.C.):
   [ ] Attached, Document ID:_____ [X] Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification:
   [ ] Attached, Document ID:_____ [X] Not Applicable
6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.):
   [ ] Attached, Document ID:_____ [X] Not Applicable
7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.):
   [X] Attached, Document ID: Attach. F [ ] Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.):
   [X] Attached, Document ID: Attach. G [ ] Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.):
   [X] Attached, Document ID: Attach. H [ ] Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.):
    [ ] Attached, Document ID:_____ [X] Not Applicable

FACILITY INFORMATION

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.):
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications

1. List of Insignificant Activities (Required for initial/renewal applications only):
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought):
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan (Required for all initial/revision/renewal applications):
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only):
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities On site but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) :
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID: See Application Letter ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: Combustion Turbine No. 8 (CT8)

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code: C	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? ☒ Yes ☐ No

9. Package Unit:
Manufacturer: General Electric Model Number: PG7241 7FA

10. Generator Nameplate Rating: 172 MW (at 59 F ambient temperature firing natural gas)

11. Emissions Unit Comment:

Emissions Unit Control Equipment

1. Control Equipment/Methods Description:
   Dry low NOx burners used to control NOx when firing natural gas.
   Water injection used to control NOx when firing fuel oil.

2. Control Device or Method Code(s): 205, 028

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:	1,984 (HHV) million Btu/hr	(Natural gas firing)
	2,049 (HHV) million Btu/hr	(Fuel oil firing)
4. Maximum Incineration Rate:	pounds/hr	
	tons/day	
5. Requested Maximum Operating Schedule:		
For natural gas firing:	24 hours/day	7 days/week
	52 weeks/year	5,000 hours/year
For 0.05% sulfur fuel oil firing:	16 hours/day	7 days/week
	52 weeks/year	800 hours/year

6. Operating Capacity/Schedule Comment:
The unit will be operated between 50 and 100 percent of full load. The maximum heat input shown in Field 3 is with operation at 100 percent load at the site minimum ambient temperature of 7°F. Operation at 100 percent load and a 59°F is expected to have a corresponding maximum heat input of 1,804 mmBtu/hr and 1,989 mmBtu/hr (HHV) for natural gas and fuel oil, respectively. Note that the heat input rates are a function of operating parameters and ambient conditions. With this application JEA is requesting a permit limit of 5,000 hours per year of total annual CT8 operation and up to 800 hours per year of fuel oil firing in CT8.

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: CT8	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: One 90-foot vertical cylindrical exhaust stack associated with the CT.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: N/A		
5. Discharge Type Code: V	6. Stack Height: 90 feet	7. Exit Diameter: 18.0 feet
8. Exit Temperature: 1,110 °F	9. Actual Volumetric Flow Rate: 2,399,000 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: Dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 439.8173 North (km): 3359.1603	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Exit temperature and flow rate are with operation of the combustion turbine at 100 percent load on natural gas at an ambient temperature of 59°F.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Natural gas used in the combustion turbine.		
2. Source Classification Code (SCC): 2-01-002-01	3. SCC Units: Million Cubic Feet Burned	
4. Maximum Hourly Rate: 1.99 (approx.)	5. Maximum Annual Rate: 9,065 (approx.)	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 995 (HHV)
10. Segment Comment: Approximate fuel use rate calculations: (heat input at HHV)/(fuel HHV) = hourly rate (1,984 mmBtu/hr)/(995 mmBtu/million scf) = 1.99 million scf/hour [(1,804 mmBtu/hr)/(995 mmBtu/million scf)]x(5,000 hr/yr) = 8,955 million scf/yr Maximum hourly rate is based on operation at 7°F ambient temperature and maximum annual rate based on operations at 59°F ambient temperature. Approximate fuel use rates are provided for informational purposes only and do not constitute limits. Actual fuel use rates are a function of the fuel heating value and the emission unit operating conditions.		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Fuel oil used in the combustion turbine.		
2. Source Classification Code (SCC): 2-01-001-01	3. SCC Units: Thousand Gallons Burned	
4. Maximum Hourly Rate: 15.0 (approx.)	5. Maximum Annual Rate: 11,615 (approx.)	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 137 (HHV)
10. Segment Comment: Approximate fuel use rate calculations: (heat input at HHV)/(fuel HHV) = hourly rate (2,049 mmBtu/hr)/(137 mmBtu/kgal) = 15.0 kgal/hour [(1,989 mmBtu/hr)/(137 mmBtu/kgal)]x(800 hr/yr) = 11,615 kgal/yr Maximum hourly rate is based on operation at 7°F ambient temperature and maximum annual rate based on operations at 59°F ambient temperature. Actual fuel use rates are a function of the fuel heating value and the emission unit operating conditions. Approximate fuel use rates are provided for informational purposes only and do not constitute limits.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**205**	**028**	**EL**
CO			
VOC			
SO2			**WP**
PM			
PM10			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 335.0 lb/hour 336.4 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: [ ] 5 years [ ] 10 years

10. Calculation of Emissions:

Highest hourly emissions:
Natural gas = 108.3 lb/hr @ 7°F and 98.3 lb/hr @ 59°F
Fuel oil = 335.0 lb/hr max @ 7°F and 325.0 lb/hr @ 59°F
Potential annual emissions:
Potential annual emissions are based on operation at 100% load and 59°F and the maximum allowable hours of low sulfur fuel oil (0.05% sulfur) firing of 800 hours per year and total operation of 5,000 hours per year.
Annual emissions = [(98.3 lb/hr) x (4,200 hr/yr) + (325.0 lb/hr) x (800 hr/yr)] / (2,000 lb/ton) = 336.4 ton/yr

11. Potential, Fugitive, and Actual Emissions Comment: The potential hourly and annual emissions are for informational purposes only and do not constitute limits.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 3

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 15 ppmvd	4. Equivalent Allowable Emissions: 98.3 lb/hour 245.8 tons/year
5. Method of Compliance: CEMS	
6. Allowable Emissions Comment (Description of Operating Method): The allowable emissions level in Field 3 is from NSPS Subpart KKKK and applies when CT8 is operating on natural gas at greater than 75 percent load. Equivalent allowable emissions are based on operation at 59°F ambient temperature for a maximum of 5,000 hours per year and are included for informational purposes only and do not constitute permit limits.	

Allowable Emissions Allowable Emissions 2 of 3

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 42 ppmvd	4. Equivalent Allowable Emissions: 325.0 lb/hour 130.0 tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): The allowable emissions level in Field 3 is from NSPS Subpart KKKK and applies when CT8 is operating on fuel oil at greater than 75 percent load. Equivalent allowable emissions are based on operation at 59°F ambient temperature and for a maximum of 800 hours per year and are included for informational purposes only and do not constitute permit limits.	

Allowable Emissions Allowable Emissions 3 of 3

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 96 ppmvd	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method): The allowable emissions level in Field 3 is from NSPS Subpart KKKK and applies when CT8 is operating at less than 75 percent load.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 66.0 lb/hour 87.3 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: [ ] 5 years [ ] 10 years

10. Calculation of Emissions:

Highest hourly emissions:
Natural gas = 32.0 lb/hr @ 7°F and and 29.0 lb/hr @ 59°F
Fuel oil = 66.0 lb/hr @ 59°F
Potential annual emissions:
Potential annual emissions are based on operation at 100% load and 59°F and the maximum allowable hours of low sulfur fuel oil (0.05% sulfur) firing of 800 hours per year and total operation of 5,000 hours per year.
Annual emissions = [(29.0 lb/hr) x (4,200 hr/yr) + (66.0 lb/hr) x (800 hr/yr)] / (2,000 lb/ton) = 87.3 ton/yr

3000 560

69.9 Tpy

11. Potential, Fugitive, and Actual Emissions Comment: The potential hourly and annual emissions are for informational purposes only and do not constitute limits.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM/PM10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 45 lb/hour 57.9 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: [ ] 5 years [ ] 10 years

10. Calculation of Emissions:

Highest hourly emissions:
Natural gas = 19 lb/hr
Fuel oil = 45 lb/hr
Potential annual emissions:
Potential annual emissions are based on the maximum allowable hours of low sulfur fuel oil (0.05% sulfur) firing with the remainder of operation on natural gas. Therefore, worst-case annual PM/PM_{10} emissions are with 800 hours of operation on the low sulfur fuel oil and 4,200 hours of operation on natural gas.
Annual emissions = [(19 lb/hr) x (4,200 hr/yr) + (45 lb/hr) x (800 hr/yr)] / (2,000 lb/ton) = 57.9 ton/yr

11. Potential, Fugitive, and Actual Emissions Comment: The potential hourly and annual emissions are for informational purposes only and do not constitute limits.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Compliance demonstrated by opacity	
6. Allowable Emissions Comment (Description of Operating Method): BACT for PM/PM10 is proposed as the use of natural gas and low sulfur fuel oil with a 10 percent opacity standard proposed as a surrogate for.	

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:
3. Potential Emissions: 105.8 lb/hour 63.3 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: [ ] 5 years [ ] 10 years

10. Calculation of Emissions:

Highest hourly emissions for combined cycle operation:
Natural gas (2 grains sulfur per 100 scf) = 11.7 lb/hr @ 7°F and 10.6 lb/hr @ 59°F
Fuel oil (0.05% sulfur) = 105.8 lb/hr @ 7°F and 102.7 lb/hr @ 59°F
Potential annual emissions:
Potential annual emissions are based on operation at 100% load and 59°F and the maximum allowable hours of low sulfur fuel oil (0.05% sulfur) firing of 800 hours per year and total operation of 5,000 hours per year.
Annual emissions = [(10.6 lb/hr) x (4,200 hr/yr) + (102.7 lb/hr) x (800 hr/yr)] / (2,000 lb/ton) = 63.3 ton/yr

11. Potential, Fugitive, and Actual Emissions Comment: The potential hourly and annual emissions are for informational purposes only and do not constitute limits.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: Use of natural gas with less than 20 grains sulfur per 100 standard cubic feet	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Natural gas supplier tariff sheet	
6. Allowable Emissions Comment (Description of Operating Method): The natural gas sulfur standard is associated with NSPS Subpart KKKK. Per 40 CFR 60.4365, JEA is requesting that they be exempt from the requirement to monitor fuel sulfur content by demonstrating the fuel sulfur content through the natural gas tariff sheet.	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.05% sulfur, by weight, in the fuel oil	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Fuel oil purchase contract	
6. Allowable Emissions Comment (Description of Operating Method): The fuel oil sulfur standard is associated with NSPS Subpart KKKK. Per 40 CFR 60.4365, JEA is requesting that they be exempt from the requirement to monitor fuel sulfur content by demonstrating the fuel sulfur content through the fuel oil purchase contract.	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC	2. Total Percent Efficiency of Control:
3. Potential Emissions: 7.5 lb/hour 8.9 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: [ ] 5 years [ ] 10 years

10. Calculation of Emissions:

Maximum hourly emissions:
Natural gas = 3.2 lb/hr @ 7 °F and 2.8 lb/hr @ 59 °F
Fuel oil = 7.5 lb/hr @ 59 °F
Potential annual emissions:
Potential annual emissions are based on operation at 100% load and 59°F and the maximum allowable hours of low sulfur fuel oil (0.05% sulfur) firing of 800 hours per year and total operation of 5,000 hours per year.
Annual emissions = [(2.8 lb/hr) x (4,200 hr/yr) + (7.5 lb/hr) x (800 hr/yr)] / (2,000 lb/ton) = 8.9 ton/yr

3000 500

11. Potential, Fugitive, and Actual Emissions Comment: The potential annual emissions are for informational purposes only and do not constitute limits.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions _ of _

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _ of _

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation ___ of __

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor 1 of 1

1. Parameter Code: EM	2. Pollutant(s): NOX
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information... Manufacturer: TBD Model Number: TBD	Serial Number: TBD
5. Installation Date: TBD	6. Performance Specification Test Date: TBD
7. Continuous Monitor Comment: Rule: 40 CFR 60 and 40 CFR Part 75.	

Continuous Monitoring System: Continuous Monitor _ of _

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor _ of _

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. I [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. J [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. K [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [X] Attached, Document ID: Attach. L [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [X] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: _____ [X] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e))
   [X] Attached, Document ID: Attach. M [ ] Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(4)(d), F.A.C., and Rule 62-212.500(4)(f), F.A.C.)
   [X] Attached, Document ID: Attach. N [ ] Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only)
   [X] Attached, Document ID: Attach. O [ ] Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

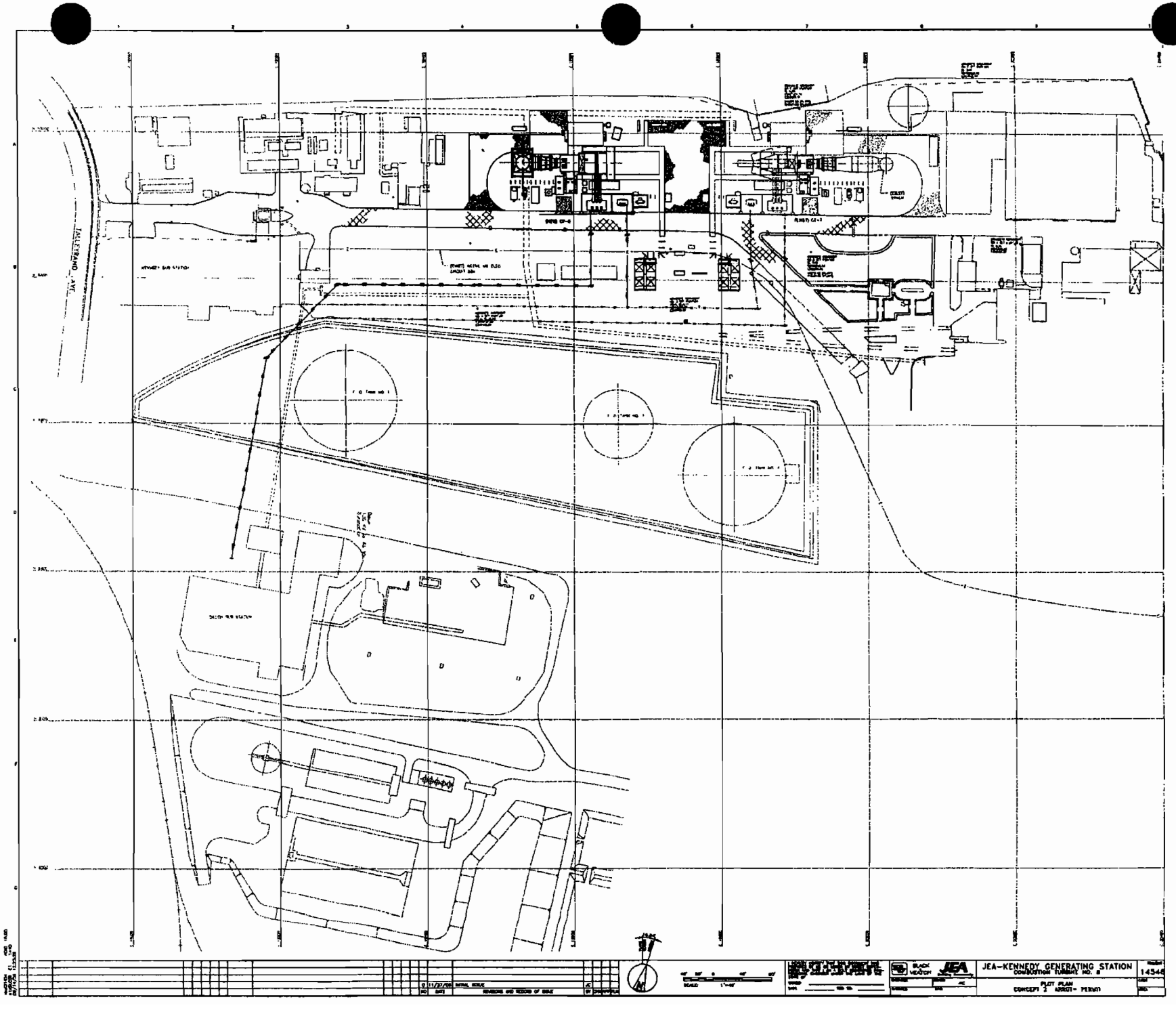
1. Identification of Applicable Requirements
   [ ] Attached, Document ID: _____
2. Compliance Assurance Monitoring
   [ ] Attached, Document ID: _____ [ ] Not Applicable
3. Alternative Methods of Operation
   [ ] Attached, Document ID: _____ [ ] Not Applicable
4. Alternative Modes of Operation (Emissions Trading)
   [ ] Attached, Document ID: _____ [ ] Not Applicable
5. Acid Rain Part Application
   [ ] Certificate of Representation (EPA Form No. 7610-1)
      [ ] Copy Attached, Document ID: _____
   [ ] Acid Rain Part (Form No. 62-210.900(1)(a))
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
      [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date: _____
   [ ] Not Applicable

Additional Requirements Comment

Attachment P includes a CD with the project modeling files.

Attachment A

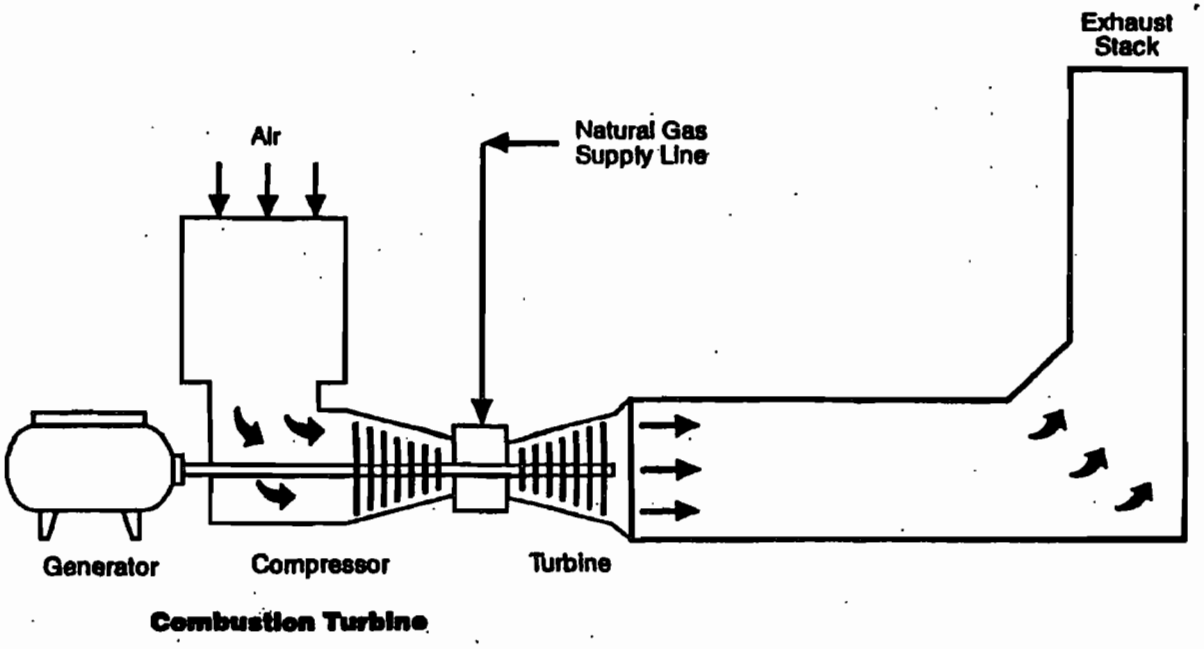
Facility Plot Plan


JEA-KENNEDY GENERATING STATION
COMBUSTION TURBINE NO. 8
PLOT PLAN
CONCEPT 2 ARRGT- PERMIT
14546

Attachment B

Process Flow Diagram

Simple Cycle-Combustion Turbine Process Flow Diagram



SIMPLE CYCLE COMBUSTION TURBINE

Attachment C

Precautions to Prevent Emissions of Unconfined Particulate Matter

Precautions to Prevent Emissions of Unconfined Particulate Matter

Reasonable precautions to control unconfined emissions of particulate matter as listed in Rule 62-296.320(4), FAC will be employed as appropriate. Additionally, watering will be used as needed to prevent emissions from unpaved areas.

Attachment D

Description of Proposed Construction or Modification

Description of Proposed Construction or Modification

JEA proposes to install a simple cycle GE 7FA simple cycle combustion turbine (CT8) at their existing Kennedy Generating Station in Jacksonville, Florida. No new major support facilities are included as part of this project. Existing fuel oil storage tanks will be used to store fuel oil for CT8. A more detailed description of the proposed construction can be found in the application technical support document accompanying this application.

Attachment E

Rule Applicability Analysis

Rule Applicability Analysis

Rule Applicability Analysis for the Entire Facility

State: Rule 62-4.070 – Standards for Issuing or Denying Permits.

State: Rule 62-210.300 – Permits Required.

State: Rule 62-212.300 – General Preconstruction Review Requirements.

State: Rule 62-212.400 – Prevention of Significant Deterioration.

Rule Applicability Analysis for the GE 7FA Combined Cycle Combustion Turbine

NOT APPLICABLE - Federal: 40 CFR Part 63 Subpart YYYY, *National Emission Standards for Stationary Combustion Turbines*. This standard is only applicable to emission units at a facility that is a major source of HAPs. Because the Kennedy Generating Station is not and will not be a major source of HAPs after the project, 40 CFR 63 Subpart YYYY does not apply to the combustion turbine.

NOT APPLICABLE - Federal: 40 CFR Part 60 Subpart GG (Rule 62-204.800(8)(b).39) – *Standards of Performance for Stationary Gas Turbines.* Because CT8 is subject to NSPS Subpart KKKK, it is not be subject to Subpart GG.

The following rules are applicable to the CT8:

Federal: 40 CFR Part 60 Subpart KKKK – *Standards of Performance for Stationary Gas Turbines*

Federal: 40 CFR Part 60 Subpart A – *General Provisions.*

Federal: 40 CFR Part 72 – *Permits Regulation (Acid Rain)*

Federal: 40 CFR Part 75 – *Continuous Emissions Monitoring*

State: Rule 62-204.800(8)(d) – *General Provisions Adopted – 40 CFR 60 Subpart A – General Provisions adopted by reference, with exceptions.*

State: Rule 62-212.400 – *Prevention of Significant Deterioration* applies to PM, and PM_{10}. See the technical support document accompanying this application for a more detailed discussion of PSD applicability.

State: Rule 62-212.300 – *General Preconstruction Review Requirements.* Applies to applicable pollutants not subject to PSD review.

State: Rule 62-297.310 – *General Compliance Test Requirements.*

Attachment F

Source Impact Analysis

Source Impact Analysis

The source impact analysis is included as Section 4.0 of the technical support document included with this application.

Attachment G

Air Quality Impact Since 1977

Air Quality Impact Since 1977

A discussion of the Air Quality Impact since 1977 is included in Section 5 of the technical support document included with this application.

Attachment H

Additional Impact Analyses

Additional Impact Analyses

Additional Impact Analyses are included in Section 5 of the technical support document included with this application.

Attachment I

Fuel Analysis or Specification

Fuel Analysis or Specification

Fuel is specified as pipeline natural gas or No. 2 fuel oil containing no more than 0.05 percent sulfur.

Attachment J

Detailed Description of Control Equipment

Detailed Description of Control Equipment

Dry Low-NO_x Burners

NO_x formation can be limited by lowering combustion temperatures and by staging combustion (i.e., creating a reducing atmosphere followed by an oxidizing atmosphere). The use of dry low-NO_x (DLN) burners as a way to reduce flame temperature is one common NO_x control method. These combustor designs are called DLN burners because, when firing natural gas, injecting water into the combustion chamber is not necessary to achieve low NO_x emissions. Most industry gas turbine manufacturers today have developed this type of lean premix combustion system as the state of the art for NO_x controls in combustion turbines.

Water or Steam Injection

NO_x emissions can be controlled by either water or steam injection. This type of control injects water or steam into the primary combustion zone with the fuel. The water or steam serves to reduce NO_x formation by reducing the peak flame temperature. The degree of reduction in NO_x formation is proportional to the amount of water injected into the combustion turbine. A limit exists, however, on the amount of water that can be injected into the system before reliability of the combustion turbine is seriously degraded and operational life is affected. The development of dry low-NO_x burners has replaced the use of wet controls, except for certain cases, such as oil firing. Since CT8 will fire natural gas as the primary fuel with low sulfur fuel oil as a back up, water injection will only be used during oil firing.

Attachment K

Procedures for Startup and Shutdown

Procedures for Startup and Shutdown

Procedures for startup and shutdown will be completed in accordance with manufacturers' operating procedures and/or plant operating procedures.

Attachment L

Operation and Maintenance Plan

Operation and Maintenance Plan

CT8 will be operated and maintained in accordance with manufacturer's recommendations, operations and maintenance experience, and technical guidance taking into account protection of equipment, safety of personnel and other factors as deemed necessary to maintain compliance with the permitted limits.

Attachment M

Control Technology Review and Analysis

Control Technology Review and Analysis

The control technology review and analysis is included in Section 3 of the application support document included with this application.

Attachment N

Good Engineering Practice Stack Height Analysis

Good Engineering Practice Stack Height Analysis

A good engineering practice stack height analysis is included in Section 4 of the application support document included with this application.

Attachment O

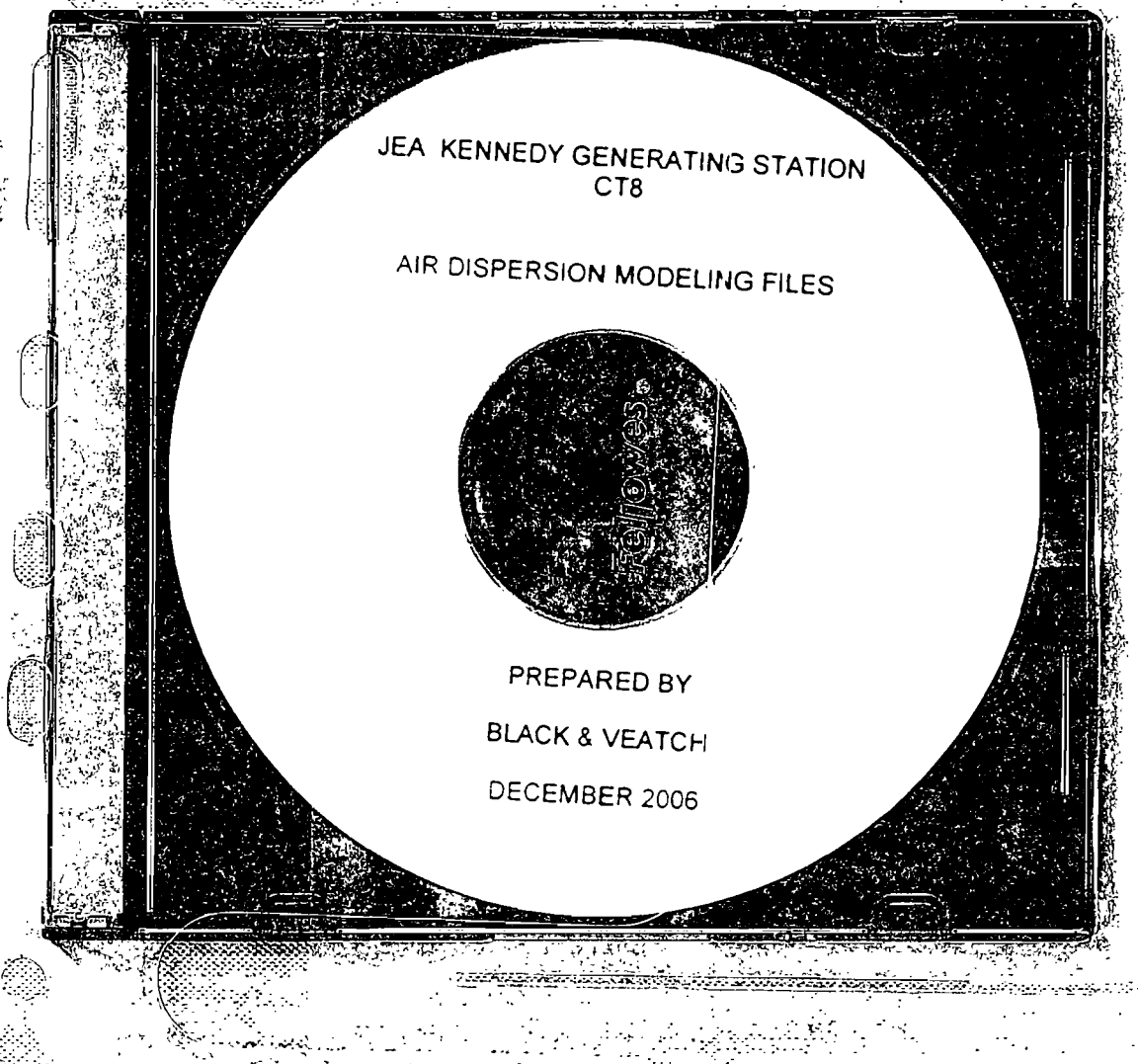
Description of Stack Sampling Facilities

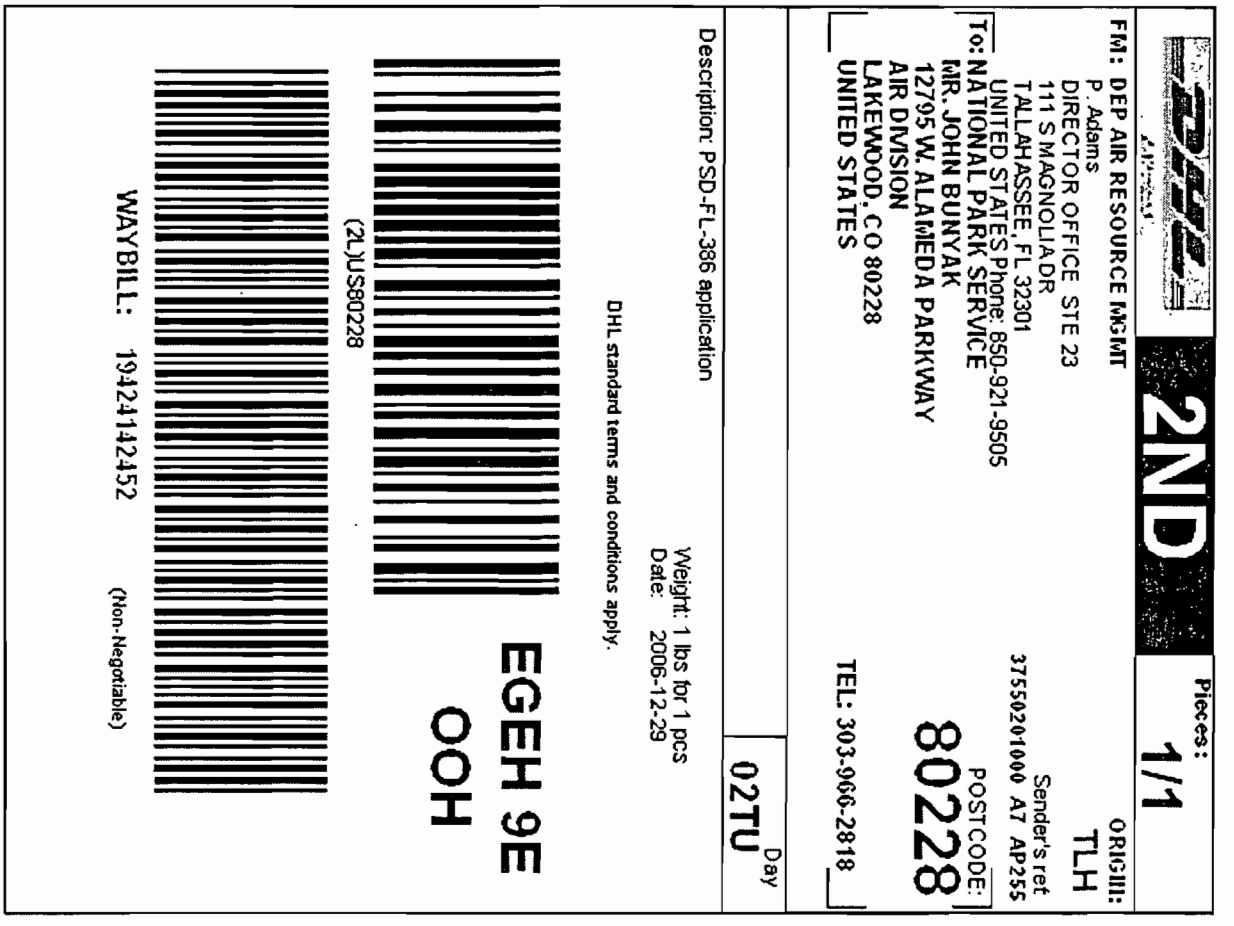
Description of Stack Sampling Facilities

CT8 will be equipped with stack sampling facilities appropriate for performing required stack testing. A detailed description of stack sampling facilities is not available at this time. When available, if requested by the Department, the stack sampling facilities description will be supplied to the Department.

Attachment P

Air Dispersion Modeling Files (CD)


JEA KENNEDY GENERATING STATION
CT8
AIR DISPERSION MODELING FILES
PREPARED BY
BLACK & VEATCH
DECEMBER 2006



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SENDER'S RECEIPT
Waybill #: 19424142452

To(Company):
National Park Service
Air Division
12795 W. Alameda Parkway

Lakewood, CO 80228
UNITED STATES

Attention To: Mr. John Bunyak
Phone#: 303-966-2818

Sent By: P. Adams
Phone#: 850-921-9505

Rate Estimate: 4.68
Protection: Not Required
Description: PSD-FL-386 application

Weight (lbs.): 1
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: 2nd Day (2nd business day by 5 PM)

Special Svc:

Date Printed: 12/28/2006
Bill Shipment To: Sender
Bill To Acct: 778941286

DHL Signature (optional) _____ Route _____ Date _____ Time _____

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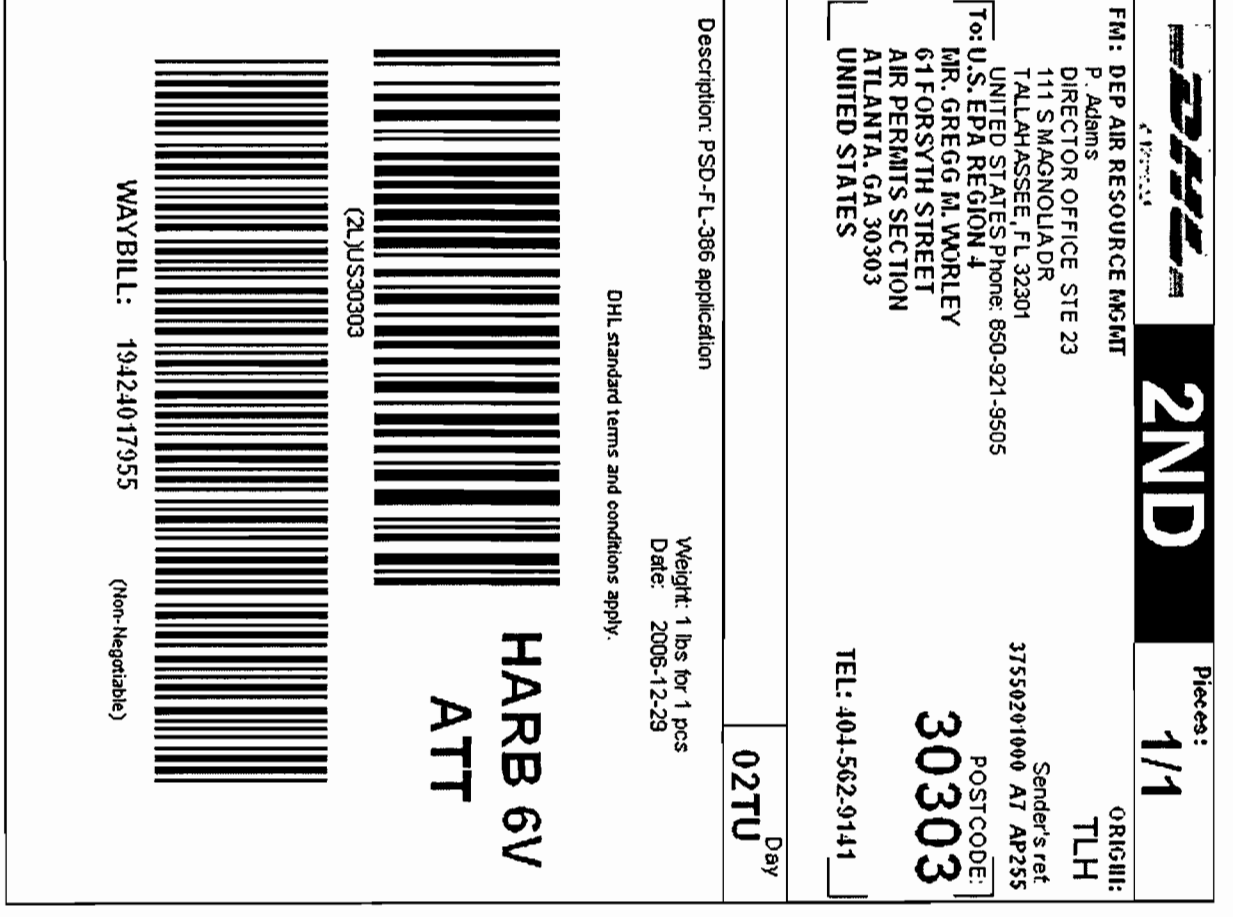

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Waybill #: 19424017955

To(Company):
U.S. EPA Region 4
Air Permits Section
61 Forsyth Street

Atlanta, GA 30303
UNITED STATES

Attention To: Mr. Gregg M. Worley
Phone#: 404-562-9141

Sent By: P. Adams
Phone#: 850-921-9505

Rate Estimate: 3.4
Protection: Not Required
Description: PSD-FL-386 application

Weight (lbs.): 1
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: 2nd Day (2nd business day by 5 PM)

Special Svc:

Date Printed: 12/28/2006
Bill Shipment To: Sender
Bill To Acct: 778941286

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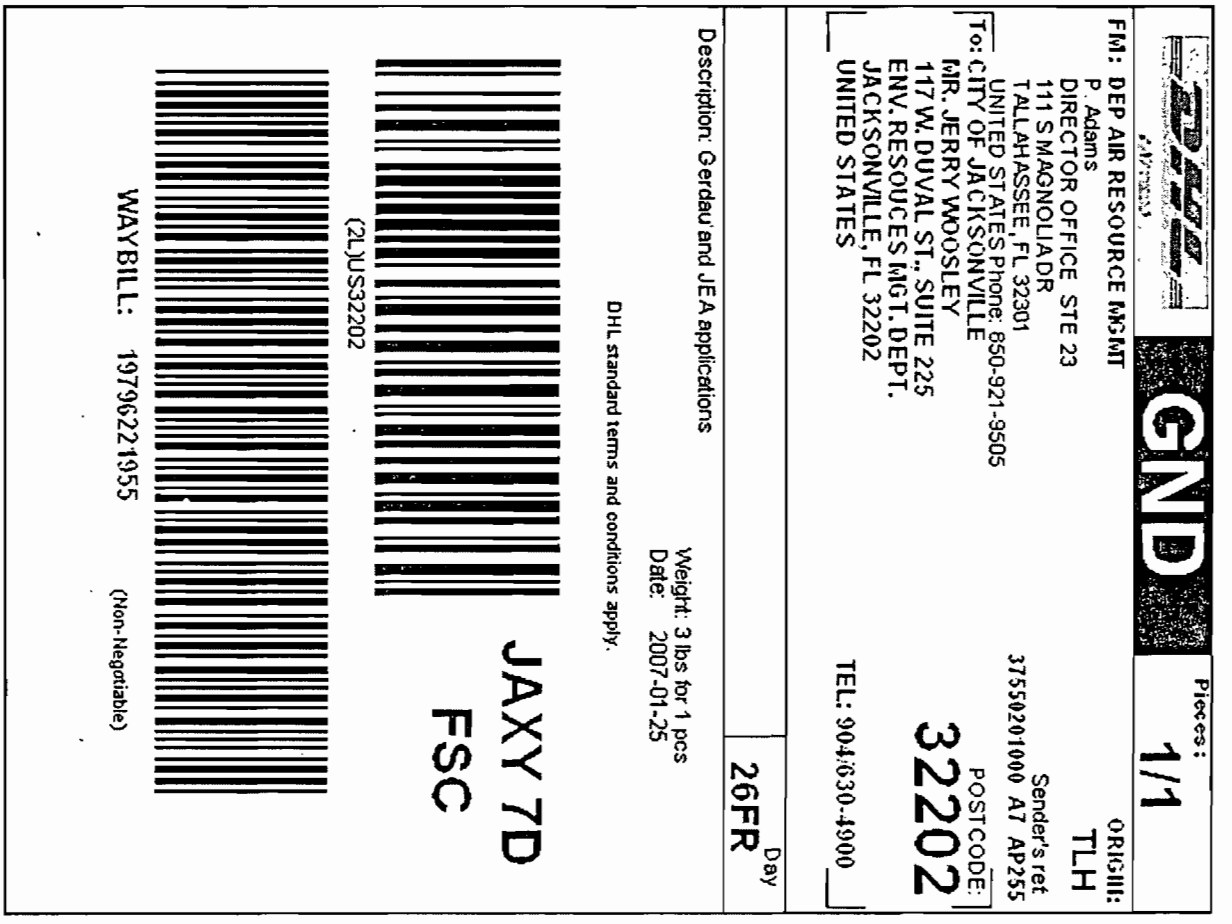

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SENDER'S RECEIPT
Waybill #: 19796221955

To(Company):
City of Jacksonville
Env. Resouces Mgt. Dept.
117 W. Duval St., Suite 225

Jacksonville, FL 32202
UNITED STATES

Attention To: Mr. Jerry Woosley
Phone#: 904/630-4900

Sent By: P. Adams
Phone#: 850-921-9505

Rate Estimate: 3.07
Protection: Not Required
Description: Gerdau and JEA applications

Weight (lbs.): 3
Dimensions: 0 x 0 x 0

Ship Ref: 37550201000 A7 AP255
Service Level: Ground (Est. delivery in 1 business day(s))

Special Svc:

Date Printed: 1/25/2007
Bill Shipment To: Sender
Bill To Acct: 778941286

DHL Signature (optional) _____ Route _____ Date _____ Time _____

For Tracking, please go to www.dhl-usa.com or call 1-800-225-5345

Thank you for shipping with DHL

Create new shipment ▶ View pending shipments Print waybill

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