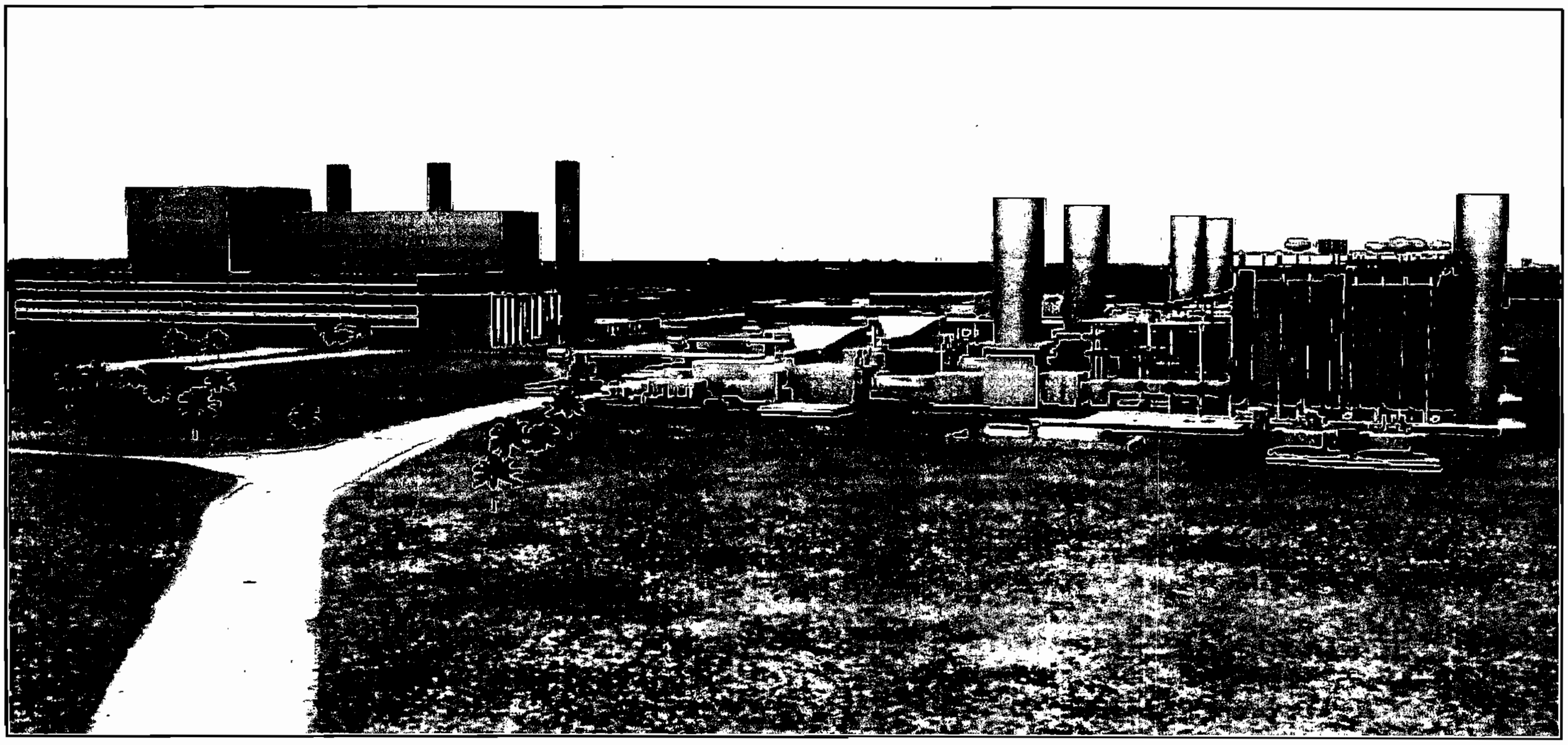
PSD PERMIT APPLICATION
BARTOW POWER PLANT
REPOWERING PROJECT



Submitted to:
Florida Department of Environmental Protection

On Behalf of
Florida Power Corporation dba Progress Energy, Florida, Inc.

Progress Energy

Submitted by:

Golder Associates

July 2006 **053-9576**

Progress Energy

July 28, 2006

RECEIVED

JUL 31 2006

BUREAU OF AIR REGULATION

Mr. Alvaro Linero, PE
Professional Engineer Administrator
Division of Air Resource Management
Florida Department of Environmental Protection
2600 Blair Stone Road, M.S. 5500
Tallahassee, Florida 32399-2400

RE: Application for PSD Air Construction Permit
Florida Power Corporation dba Progress Energy Florida, Inc.
P.L. Bartow Plant
Facility ID 1030011

Dear Mr. Linero:

Please find enclosed four (4) copies of a PSD air construction permit application for the repowering of the Florida Power Corporation dba Progress Energy Florida, Inc. ("PEF") Bartow Plant. Also enclosed is the required $7500 permit fee.

If you have any questions, please contact me at (727)820-5962 or Jamie Hunter at (727) 820-5764. Thank you for your assistance.

Sincerely,

Ann Quillian

Ann Quillian, PE
Senior Environmental Specialist
Environmental Services Section

Enclosures

cc: Mr. Gary Robbins, PCDEM

Progress Energy Florida, Inc.
100 Central Avenue
Saint Petersburg, FL 33701

Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

August 14, 2006

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

RE: Progress Energy Florida, Inc.
Bartow Plant Repowering Project
1030011-010-AC, PSD-FL-381

Dear Mr. Bunyak:

Enclosed for your review and comment is a PSD permit application from Progress Energy Florida, Inc. for the repowering of the Bartow Plant in Saint Petersburg, Pinellas 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 me at 850/921-9523.

Sincerely,

Patty Adams

for A. A. Linero, P.E., Administrator
South Permitting Section

AAL/pa

Enclosure

Jeb Bush
Governor

Department of Environmental Protection

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

Colleen M. Castille
Secretary

August 4, 2006

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

RE: Progress Energy Florida, Inc.
Bartow Plant Repowering Project
1030011-010-AC, PSD-FL-381

Dear Mr. Worley:

Enclosed for your review and comment is a PSD permit application from Progress Energy Florida, Inc. for the repowering of the Bartow Plant in Saint Petersburg, Pinellas 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 me at 850/921-9523.

Sincerely,

Patty Adams

for A. A. Linero, P.E., Administrator
South Permitting Section

AAL/pa

Enclosure

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MS. MARA NASCA
8407 LAUREL FAIR CIRCLE
AIR RESOURCES
TAMPA, FL 33610
UNITED STATES

POSTCODE:
33610

TEL: 813-744-6100

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8407 Laurel Fair Circle

Tampa, FL 33610
UNITED STATES

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Phone#: 813-744-6100

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

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To: NATIONAL PARK SERVICE
MR. JOHN BUNYAK
12795 W. ALAMEDA PARKWAY
AIR DIVISION
LAKEWOOD, CO 80228
UNITED STATES

POSTCODE: 80228

TEL: 303-966-2818

Time 10:30

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Air Division
12795 W. Alameda Parkway

Lakewood, CO 80228
UNITED STATES

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Phone#: 303-966-2818

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

Rate Estimate: 14.99
Protection: Not Required
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TALLAHASSEE, FL 32301
UNITED STATES Phone: 850-921-9505

ORIGIN: TLH

Sender's ref
37550201000 A7 AP255

To: U.S. EPA REGION 4
MR. GREGG M. WORLEY
61 FORSYTH STREET
AIR PERMITS SECTION
ATLANTA, GA 30303
UNITED STATES

POSTCODE:
30303

TEL: 404-562-9141

Day
07MO

Description: PSD-FL-355 correspondence PSD-FL-381 application
Weight: 5 lbs for 1 pcs
Date: 2006-08-04

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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: 3.1
Protection: Not Required
Description: PSD-FL-355 correspondence
PSD-FL-381 application

Weight (lbs.): 5
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Progress Energy Service Company, LLC
on behalf of Progress Energy, Inc. subsidiaries
P.O. Box 1551
Raleigh, NC 27602

Progress Energy

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Invoice Number	Invoice Date	Adjustments	Paid Amount
[illegible]06	18-JUL-06	0.00	7,500.00
Questions? Invoice.Inquiry@pgnmail.com		$ .00	$ 7,500.00
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on behalf of Progress Energy, Inc. subsidiaries
P.O. Box 1551
Raleigh, NC 27602

Progress Energy

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Vendor Number 150283

VOID AFTER 6 MONTHS FROM DATE

Check Date
27-JUL-06 158541

*******7,500.00

Pay Exactly **Seven Thousand Five Hundred Dollars And 00 Cents*******************

TO THE ORDER OF
FL DEPT OF ENVIRONMENTAL PROTECTION
2600 BLAIR STONE RD
MS 5500
TALLAHASSEE, FL 32399-2400

Wachovia Bank, N.A.
Augusta, GA

Signature

158541 061209756 2079900415067

Golder Associates Inc.

5100 West Lemon Street, Suite 114
Tampa, FL USA 33609
Telephone (813) 287-1717
Fax (813) 287-1716
www.golder.com

Golder Associates

RECEIVED
JUL 31 2006
BUREAU OF AIR REGULATION

PSD PERMIT APPLICATION
BARTOW POWER PLANT
REPOWERING PROJECT

Submitted to:

Florida Department of Environmental Protection

Submitted on behalf of:

Florida Power Corporation dba Progress Energy Florida, Inc.
100 Central Avenue
St. Petersburg, Florida 33701

Submitted by:

Golder Associates Inc.
5100 West Lemon Street
Suite 114
Tampa, Florida 33609

Distribution:

4 Copies	-	Florida Department of Environmental Protection
1 Copy		Progress Energy Florida
1 Copy	-	Golder Associates Inc.

July 2006

053-9576

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1.0 INTRODUCTION

Florida Power Corporation dba Progress Energy Florida, Inc. (Progress Energy) is proposing to repower its existing P.L. Bartow Power Plant (Facility ID No. 1030011) in Pinellas County, Florida. The project site is approximately 675 acres in size and presently contains the existing P.L. Bartow Power Plant. The site is located in eastern Pinellas County on Tampa Bay (see Figure 1-1) at 1601 Weedon Island Drive, St. Petersburg, Pinellas County; UTM Coordinates: Zone 17, 342.4 km East and 3,082.6 km North; Latitude: 27° 52' 10" North and Longitude: 82° 35' 59" West.

This application addresses the proposed repowering project (the Project) at the Bartow Power Plant, as well as the addition of a combustion turbine designated for simple cycle (peaking) use only. The three existing boilers will be replaced with a 4-on-1 combined cycle power block. This power block configuration will consist of four combustion turbines (CTs), with associated heat recovery steam generators (HRSGs), exhausting to one steam turbine (ST) generator. Also, the Project includes duct burner (DB) firing, power augmentation (PA), and evaporative cooling, resulting in an estimated increase of 827 MW (winter) over the existing plant's capacity. All of the increased capacity will result from the new non-steam CTs. Since no net increase in *steam-powered* electricity generation will result from this project, it is exempted from licensing requirements under the Florida Electrical Power Plant Siting Act (FPPSA), Chapter 403, Part II, Florida Statutes.

A separate generating unit, a fifth CT in a simple cycle mode, nominally rated at 190 MW (winter), will be installed in addition to the repowering project. No steam-powered generation will result from the peaking unit, therefore the additional peaking unit will also be exempted from the licensing requirements under the FPPSA. Natural gas is the proposed primary fuel, with distillate fuel oil as back up for both the combined cycle power block and the simple cycle peaker.

The Bartow Power Plant operates under Title V Air Operation Permit No. 1030011-009-AV, with an effective date of January 1, 2005 and expiration date of December 31, 2009. This application contains the information required by Rule 62-213.420(3), F.A.C., including FDEP Form No. 62-210.900(1), Effective: 02/02/06, Application for Air Permit – Long Form.

This PSD Report is divided into the following major sections:

- Section 1.0 provides the Project introduction;
- Section 2.0 presents a description of the Bartow Repowering Project, including air emissions and stack parameters;
- Section 3.0 provides a review of the PSD requirements applicable to the Bartow Repowering Project;
- Section 4.0 includes the BACT control technology review;
- Section 5.0 discusses the ambient air monitoring analysis (pre-construction monitoring) required by PSD regulations;
- Section 6.0 presents a summary of the air modeling approach and results used in assessing compliance of the proposed facility with ambient air quality standards (AAQS), and PSD increments; and
- Section 7.0 provides the additional impact analyses for soils, vegetation, and visibility.

2.0 PROJECT DESCRIPTION

The existing Bartow Power Plant (Facility ID No. 1030011) consists of three fossil fuel-fired electric utility steam generating units (EUSGUs), a pipeline heating boiler, four gas turbine peaking units and as-needed relocatable diesel generator(s). The Project consists of repowering the existing EUSGUs with a combined cycle natural gas-fired power block as well as the addition of a separate simple cycle peaking unit. A brief description of the existing EUSGUs to be repowered is provided below.

2.1 Existing Baseline Conditions

Unit No. 1 (Emissions Unit No. -001) is a front-fired, fossil fuel steam generator which produces 120 megawatts of electric power. The maximum heat input rate is 1,220 million British thermal units per hour (MMBtu/hr) and the unit fires No. 2 through No. 6 fuel oil, and on-specification used oil. Unit 1 began commercial service in 1958.

Unit No. 2 (Emissions Unit No. -002) is a tangential-fired fossil fuel fired steam generator which produces 120 megawatts of electric power. The maximum heat input rate is 1,317 million Btu per hour and the unit fires No. 2 through No. 6 fuel oil, on-specification used oil, and propane. Unit 2 began commercial service in 1961.

Unit No. 3 (Emissions Unit No. -003) is a tangential-fired fossil fuel fired steam generator which produces 225 megawatts of electric power. The maximum heat input rate is 2,211 million Btu per hour and the unit fires No. 2 through No. 6 fuel oil, on-specification used oil, natural gas, and propane. Unit 3 began commercial service in 1963.

The four existing gas turbine peaking units (Emissions Unit Nos. -005 through -008) are capable of natural gas and oil-firing. The pipeline heating boiler (Emissions Unit No. -004) operates on natural gas, No. 2 oil or propane. These emission units will be unaffected by this proposed project and will remain after the project is complete.

2.2 New Project Conditions

The Project consists of repowering the Bartow EUSGUs with Siemens F-Class combined cycle technology and utilizes natural gas as the primary fuel with distillate fuel oil as a back-up fuel. The

Project consists of installing four combustion turbines (CTs), four heat recovery steam generators (HRSGs), and one steam turbine (ST) that replace the existing boilers and steam turbines. The Project will consist of the power block, the operations control center and directly associated facilities including an auxiliary boiler, five fuel gas heaters, general services/warehouse building, a gas metering station, and fuel oil unloading and storage facilities. Natural gas will be transported to the site via pipeline, and distillate oil will be trucked and/or barged to the site. The light oil, which will have a maximum sulfur content of 0.05 percent, will be stored onsite in two new aboveground storage tanks, each sized to hold approximately 83,333 barrels (3.5 million gallons).

When the repowering is complete, the site will contain one combined cycle unit in a 4 x 4 x 1 configuration (i.e., a 4-on-1) and produce approximately 1,279 MW winter and 1,159 MW summer, in lieu of the three EUSGUs. The resulting incremental increase in capacity will be approximately 827 MW winter and 715 MW summer, utilizing a 420 MW steam turbine. The additional (fifth CT) peaking unit included in this application would provide another 190 MW during the winter peaking season (175 MW summer). Design information and stack parameters for the proposed power equipment are summarized in Section 2.4.

The proposed combined cycle power block will be equipped with duct burner (DB) firing, power augmentation (PA) and evaporative cooling for increased output. In addition, to provide increased reliability, bypass stacks have been included in the design to allow these units to operate in simple cycle mode if steam turbine or main condenser problems occur that would preclude operation in combined cycle mode. The plant design is expected to allow a steam turbine trip without the loss of the gas turbines. This design provides maximum output, operational ease and system dispatch reliability and flexibility. The various proposed operating modes (i.e., combined cycle, simple cycle with bypass, DB firing, PA and evaporative cooling) are explained further in Section 2.3 below.

The repowering provides significant emission reductions of all criteria pollutants that might be subject to PSD review, except for emissions of carbon monoxide (CO) and volatile organic compounds (VOCs). The Project proposes to use low sulfur fuels; dry low nitrogen oxide (NO_X) burners (DLN); optionally employ selective catalytic reduction (SCR) technology; and employ good combustion practices to minimize emissions of particulate matter (PM), CO and VOCs. The good combustion practices and numerical emission limits proposed for control of CO and VOCs represent BACT for these pollutants. In addition to operation on natural gas, the Project is proposing fuel oil-firing equivalent to 1,000 hours of oil-firing per CT per year at full load.

2.3 Proposed Operating Modes

Combined Cycle Operation- The Project will be configured as a 4-on-1 combined cycle unit for base load service. The CTs will use DLN (dry low-NO_X) combustion technology when firing natural gas and water injection when firing distillate oil to minimize NO_X formation. An SCR system will be installed in each HRSG to further reduce NO_X emissions at the option of Progress Energy, as a means to assist the company in complying with the provisions of the Clean Air Interstate Rule (CAIR). SCR is not otherwise required for PSD or BACT purposes. Natural gas will be the primary fuel, and distillate oil will be the backup fuel. Distillate oil usage will be limited to the equivalent of 1,000 hours per year (hr/yr) per CT at full load.

For the Siemens F-Class CT, the maximum heat input is 2,006 MMBtu/hr (LHV) for each CT when firing natural gas (100-percent capacity, 35°F with power augmentation). The corresponding maximum fuel usage is about 2.0 million cubic feet per hour (MMcf/hr) of natural gas for each CT. Maximum potential annual fuel usage at 59°F turbine inlet temperature would be about 1.79×10^{10} cubic feet per year (cf/yr) of natural gas for each 4-on-1 combined cycle unit using the Siemens F-Class CT.

When buring fuel oil, the maximum heat input is 1,859 MMBtu/hr (LHV) for each Siemens F-Class CT (100-percent capacity, 35°F). Low-sulfur distillate oil will be limited to the equivalent of 1,000 hours per year per CT at full load for the 4-on-1 combined cycle configuration and the fifth CT. For the Siemens F-Class turbines, the maximum fuel use is about 13,400 gallons of fuel oil per hour per CT at 35°F turbine inlet temperature. Annual usage is 13.4 million gallons for each CT operating for 1,000 hours and a turbine inlet temperature of 59°F.

The duct burners for each HRSG will have a maximum natural gas firing rate of 500 MMBtu/hr higher heating value (HHV) or 450 MMBtu/hr lower heating value (LHV). The maximum annual fuel usage for the duct burners is based on 2,434 hr/yr at this heat input. The maximum potential annual natural gas usage for the duct burners is calculated to be about 4.7 billion cf/yr. Natural gas will be the only fuel fired in the duct burners.

Plant performance for each of the CTs under consideration for the Project was developed for natural gas and oil-firing at 100 percent load and turbine inlet temperatures of 35°F, 59°F, 74°F, and 95°F. The 74°F and 95°F cases on natural gas–firing were also considered with PA. Lower load cases were developed for turbine inlet temperatures of 20°F, 59°F, 74°F, and 90°F for natural gas-firing and 20°F, 59°F, 72°F, and 105°F for fuel oil-firing. These cases are described in Section 2.4.

When firing natural gas, NO_X emissions from the turbines will be controlled using DLN combustors and, optionally the SCR systems, to 15 parts per million or less by volume dry (ppmvd), corrected to 15-percent O_2. When firing low-sulfur distillate oil, all turbines will utilize water injection to reduce NO_X emissions to 42 ppmvd, corrected to 15-percent O_2.

The SCR reactors will be located in each HRSG to provide the proper operating temperature range for the required reaction between ammonia and NO_X to achieve additional NO_X reductions. The ammonia handling system will include diluent air blowers (each sized for 100-percent capacity), ammonia flow control and measurement devices, an ammonia/air mixing chamber, distribution header(s), and an ammonia injection grid (AIG). Overall control of the system will be by a distributed control system (DCS).

The SCR systems will allow Progress Energy the flexibility to achieve NO_X reductions, required for compliance with the Clean Air Interstate Rule (CAIR), in the most prudent and economical manner possible. Specifically, the air quality assessment for this Project was conducted assuming that NO_X emissions would be 15 ppmvd in both simple and combined cycle modes (natural gas-firing), even though the combined cycle power block will be SCR-capable. This application bases NOx emissions during oil-firing on 42 ppmvd. This way, as allowed under the CAIR program, Progress Energy can choose whether to comply with CAIR by means of NO_X reductions from these units or through the purchase of NO_X allowances.

Startup and Shutdown Modes- The start-up, shutdown, and fuel changes in combined cycle operation will require an excess emission allowance greater than two hours provided under the FDEP rules. During cold start-up, the operating load of the CTs is limited by the amount of steam that can be accepted by the steam turbine and will result in excess emissions. The excess emission allowance requested for the Project is similar to that previously proposed for FP&L's West County Project. The 3-on-1 combined cycle configuration associated with that project would have similar steam turbine issues during start-up and shutdown operations. The proposed condition for this project follows:

> *"<u>Excess Emissions Allowed</u>: As specified in this condition, excess emissions resulting from startup, shutdown, fuel switches and documented malfunctions are allowed provided that operators employ the best operational practices to minimize the amount and*

duration of emissions during such incidents. A "documented malfunction" means a malfunction that is documented within one working day of detection by contacting the Compliance Authority by telephone, facsimile transmittal, or electronic mail. For each gas turbine/HRSG system, excess emissions resulting from startup, shutdown, or documented malfunctions shall not exceed two hours in any 24-hour period except for the following specific cases.

a. *Steam Turbine/HRSG System Cold Startup:* For cold startup of the steam turbine system, excess emissions from any gas turbine/HRSG system shall not exceed eight (8) hours in any 24-hour period. A cold "startup of the steam turbine system" is defined as startup of the 4-on-1 combined cycle system following a shutdown of the steam turbine lasting at least 48 hours.

   {Permitting Note: During a cold startup of the steam turbine system, each gas turbine/HRSG system is sequentially brought on line at low load to gradually increase the temperature of the steam-electrical turbine and prevent thermal metal fatigue. Note that shutdowns and documented malfunctions are separately regulated in accordance with the requirements of this condition.}

b. *Gas Turbine/HRSG System Cold Startup:* For cold startup of a gas turbine/HRSG system, excess emissions shall not exceed four hours in any 24-hour period. "Cold startup of a gas turbine/HRSG system" is defined as a startup after the pressure in the high-pressure (HP) steam drum falls below 450 psig for at least a one-hour period.

c. *Steam Turbine/HRSG System Warm Startup:* For warm startup of the steam turbine system, excess emissions from any gas turbine/HRSG system shall not exceed four (4) hours in any 24-hour period. "Warm startup of the steam turbine system" is defined as startup of the 4-on-1 combined cycle system following a shutdown of the steam turbine lasting more than 8 hours and less than 48 hours.

d. *Shutdown combined Cycle Operation:* For shutdown of the steam turbine system, excess emissions from any gas turbine/HRSG system shall not exceed three (3) hours in any 24-hour period.

e. *Fuel Switching:* For fuel switching, excess emissions shall not exceed two (2) hours in any 24-hour period.

As authorized by Rule 62-210.700(5), F.A.C., the above conditions allow excess emissions only for specifically defined periods of startup, shutdown, fuel switching and documented malfunction of the gas turbines or the SCR systems. [Design; Rules 62-212.400(BACT) and 62-210.700, F.A.C.]"

By-Pass Damper Mode- In order to provide increased reliability, bypass stacks have been included in the design allowing these units to operate in simple cycle mode if there are steam turbine or main condenser problems that would preclude operation in combined cycle mode. The plant design would allow a steam turbine trip without the loss of the gas turbines. This design provides maximum output, operational ease and system dispatch reliability and flexibility. The dampers allow future operation in bypass mode, at times when the steam turbine is required to be out of service.

Duct Burner Firing, Power Augmentation and Evaporative Cooling Modes-- This 4-on-1 unit design would be used along with auxiliary duct firing for the HRSGs, steam power augmentation (PA) and evaporative cooling for the CT's to provide optimum peaking capacity from the steam turbine generator.

Duct firing was included for a worst case impact assessment. The duct burners for each HRSG associated with the 4-on-1 combined cycle unit will have a maximum firing rate of 500 MMBtu/hr (HHV) or 450 MMBtu/hr (LHV). The maximum annual fuel usage for the duct burners is based on 2,434 hr/yr per duct burner at this heat input. The maximum potential annual natural gas usage for the duct burners is calculated to be about 4.7 billion cf/year.

The CTs will be equipped to operate in power augmentation mode. Power augmentation (PA) is the injection of steam in the CTs when firing natural gas at loads above 95 percent to increase power output. About 1.5 lb steam per lb of fuel is used in this mode of operation. The CTs are proposed to operate 1,688 hours per year per CT in PA mode.

Each CT will have evaporative cooling at the turbine air inlet that reduces the inlet air temperature and increases both the efficiency and power output at elevated ambient temperatures. This cooling system will only operate when the ambient temperature is 59°F or greater and the CTs are operating. This cooling system adds water vapor to the compressor inlet of the CTs, which increases the mass flow of air by evaporative cooling, but does not impact the emissions of regulated pollutants. The CTs can operate with or without the evaporative coolers in service.

Interim Project Configuration- The CTs will be fitted with by-pass stack dampers that allow operation in simple cycle mode for operation currently targeted for December 2008. The HRSGs for these units will be commissioned, along with the remainder of the 4-on-1 power block, at a later date. It was originally envisioned that the existing three EUSGUs would be retired in phases beginning in June 2009. Due to projected power needs during the winter peak demand period, Progress Energy has determined that it will be necessary for the three existing EUSGUs to operate concurrently with up to two of the new CTs in a simple cycle mode until approximately June 2009. At that time, the entire 4-on-1 power block, including the steam cycle, will commence operation and the existing EUSGUs will be retired.

The PSD applicability assessment that was conducted for the Project was based on the permanent operating scenario, where the existing EUSGUs are retired and the resulting emission reductions will offset the increase in emissions for all pollutants, except for CO and VOCs. Modifications to an existing major facility that results in a significant net emissions increase equal to or exceeding the significant emissions rates (SER) listed in Section 62-212.400, Table 62-212.400-2, F.A.C., is classified as a major modification and will be subject to the PSD preconstruction permitting program for those pollutants that exceed the PSD SERs. The only such emission increases are for CO and VOCs.

The procedures for determining applicability of the PSD permitting program to the Project are specified in Rule 62-212.400(2), F.A.C. For each regulated pollutant, PSD is triggered as a result of a modification at an existing unit if the difference between the projected actual emissions and the baseline actual emissions equals or exceeds the SER for that pollutant, as defined at Rule 62-210.200(243), F.A.C. These emission increases, in tons per year (TPY), are projected on an annual (12-month) basis. Due to the Project phase-in schedule, discussed above, the "permanent" operating scenario will not be in effect until approximately six months from commencement of operation of the initial CT. Therefore, in order to determine PSD applicability for the temporary or interim operating scenario, both the baseline emissions and the future representative actual emissions were projected over a 12-month period (i.e., December 2008- June 2009 for the interim scenario and June 2009-December 2009 for the permanent scenario). This scenario is discussed further in Section 2.4 and the projected emissions are presented in tabular format; however, the following example is presented for NO_X emissions:

- NO_X baseline is 4,043 TPY;
- Six months of operation of existing EUSGUs (December 2008- June 2009) is approximately 50 percent of the baseline (2,022 TPY);
- Six months of operation of the Project (4-on-1 and the 5th CT) from June 2009-December 2009 is approximately 50 percent of the annual estimate for the Project (3,191 TPY) or about 1,596 TPY; and

- Subtracting each of the two above scenarios from the initial NO_X baseline (i.e., 4,043 TPY – 2,022 TPY – 1,596 TPY) leaves a balance of 426 TPY available for operation of the simple cycle CTs in the interim or temporary operating scenario.

Progress Energy anticipates that natural gas will be available for use in these CTs during this interim period, but assumes operation on either natural gas or fuel oil.

2.4 Proposed Source Emissions and Stack Parameters

Without the emission offsets from the retirement of the existing EUSGUs, this proposed project would be a major modification, subject to PSD review. As the existing three steam units will be retired, the proposed Project will use emissions credits from their retirement to net out of PSD review for all PSD pollutants, except for CO and VOCs. Table 2-1 provides a comparison of the existing site's baseline emissions to estimated emissions from the proposed project and summarizes the resulting net increase. The baseline emissions presented in this table were derived from a five-year look back (2001 through 2005) at historical emissions, including a summary of the highest two-year average for each pollutant. Baseline data, based on past Annual Operating Reports (AORs) is presented in a series of tables in Appendix A for each unit for each year. In Table 2-1, a comparison of the net increases (worst case with oil firing of 1,000 hours) to the PSD significant emission thresholds indicates that PSD review is only required for CO and VOCs. In addition, as discussed in the previous section, there will be an interim operating mode of approximately six months, during which there will be an overlap in operation among the three existing units and the new units coming online. Table 2-2 summarizes this proposed interim operating mode and presents the approximate cumulative turbine operating hours that are available (due to the emission reductions that are to be realized from existing unit retirement) without triggering PSD for these pollutants.

Performance, estimated maximum hourly emissions and exhaust information representative of each CT/HRSG option operating at base-load, 80 percent load and 60 percent load conditions are presented in Tables 2-3 and 2-4 for natural gas firing in simple cycle and combined cycle, respectively. Tables 2-5 and 2-6 present the same information for fuel oil firing for base-load, 80 percent load and 65 percent load. Plant performance for each of the CTs was developed for natural gas and oil-firing at 100 percent load and turbine inlet temperatures of 35°F, 59°F, 74°F, and 95°F. The 74°F and 95°F cases on natural gas–firing were also considered with PA. See Appendix A for lower load cases for various turbine inlet temperatures for both natural gas and distillate fuel oil.

The maximum short-term emission rates in pounds per hour (lb/hr) generally occur at base load, 35°F operation, where the CT has the greatest output and greatest fuel consumption. The CTs will be equipped to operate in PA mode, as well as concurrent DB firing with natural gas in the HRSG. Therefore, this analysis assumes that the maximum short-term emission rate occurs at base load, 35°F operation, while in PA mode with DB firing. On an annual basis, this analysis assumes that the CTs will each operate up to 1,688 hours per year in PA mode. In addition, each DB is assumed to be fired up to 2,434 hours per year.

Maximum potential annual emissions for the CTs/HRSGs for regulated air pollutants are based on an ambient temperature of 59°F. To produce the maximum annual emissions, it is assumed that each CT/HRSG would operate for 8,760 hours, of which 7,760 hr/yr are assumed to be natural gas firing with 2,434 hours fired at 100-percent load with maximum duct firing and 1,688 hr/yr of PA per CT. For the remaining 1,000 hr/yr, it is assumed that the CTs would operate on distillate oil.

For ease of review, Table 2-7 summarizes the Project's short-term emission rates (ppmvd and lb/hr) for each pollutant in each of the proposed operating modes for each fuel. The table presents both the maximum short-term rates (usually associated with the lowest turbine inlet temperatures) which were used for assessing worst-case modeled impacts and the short-term rate at ISO conditions (which is typically used to estimate annual tons per year).

Provisions for an auxiliary boiler are included in the Project design to assist in combined cycle startup, if required in the future. Once sufficient quality and quantity of steam is available from the HRSG, steam from the auxiliary boiler is not required. The future steam boiler will be a Nebraska Boiler or equivalent with steam capacity of 85,000 lb/hr and a heat input rating of up to 99 MMBtu/hr. Table 2-8 presents estimated performance and emissions information for the future auxiliary boiler. It was conservatively assumed that the annual operation of the auxiliary boiler would be 1,000 hr/yr for the startup of the Siemens F-Class CTs.

The Project will also include five natural gas-fired fuel heaters. These heaters will utilize a heat transfer fluid for heating the natural gas and be fired with only natural gas. The heat input is estimated to be approximately 3 MMBtu/hr per heater. These heaters will be used as necessary to heat natural gas above the dew point. Table 2-9 presents the estimated performance and emissions for the gas heaters. The annual emissions shown in Table 2-9 are based on 8,760 hours per year (hr/yr), although the actual usage is expected to be lower.

Emission factors for hazardous air pollutants (HAPs) were evaluated based on AP-42, the U.S. Environmental Protection Agency (EPA) Combustion Turbine Emissions Database, and the combustion turbine Maximum Achievable Control Technology (MACT) standards. The HAP emissions are based on the April 2000 revision of EPA's AP-42 emission factors for large stationary combustion turbines. Summaries of the emission factors and emission estimates for fuel oil firing and gas firing are presented in Appendix A.

The MACT standard, 40 CFR 63, Subpart YYYY is potentially applicable to the Project. The existing site is already a major source of HAP emissions since emissions exceed ten tons per year (TPY) of a single HAP and exceed 25 TPY for all HAPs. Since low sulfur distillate oil is proposed to be fired in each CT for up to 1,000 hr/yr, the proposed CTs are defined as "stationary diffusion flame oil-fired combustion turbines" under the Subpart YYYY requirements and would have the potential for an aggregate total above the rule threshold (1,000 hours of oil firing during any calendar year). Actual applicability of Subpart YYYY is based on actual fuel oil used in a calendar year. The proposed project will be required to demonstrate compliance with the combustion turbine MACT of 91-ppbvd formaldehyde corrected to 15-percent oxygen if the aggregate 1,000 hr/yr is exceeded. Based on the applicability of Subpart YYYY, compliance will be determined upon initial operation and annually (40 CFR 63.6120, Table 3).

An emission factor for toluene of 33 lb/10^{12} Btu, for natural gas firing, was developed from the data in the EPA Combustion Turbine Emissions Database. This factor is based on the median value for loads greater than 80 percent. Similar to formaldehyde emission factors, there are no confirmed test data of toluene emissions from F-Class turbines. The recent EPA emission factor, which is based on much smaller turbines than those proposed for this project, suggests toluene emissions from gas turbines of 130 lb/10^{12} Btu when firing natural gas at loads greater than 80 percent. For all loads, the average and median EPA factors are 94 and 19 lb/10^{12} Btu, respectively. Since the median emission factor is about 4 to 5 times lower than the average factor, this clearly points to the large range in toluene emissions and how the individual turbine combustion characteristics can influence the results.

The emission factors for many of the other HAPs were developed by EPA in a manner similar to toluene. For these HAPs, fewer data are available and are also considered not representative of state-of-the-art DLN combustion systems. The use of AP-42 emission factors for HAPs is considered a conservative emissions estimate approach.

The National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subpart DDDDD is applicable to industrial, commercial, or institutional boilers or process heaters. The Boiler MACT defines boiler and process heaters as follows in 40 CFR 63.7575:

"Boiler means an enclosed device using controlled flame combustion and having the primary purpose of recovering thermal energy in the form of steam or hot water. Waste heat boilers are excluded from this definition."

"Process heater means an enclosed device using controlled flame, that is not a boiler, and the unit's primary purpose is to transfer heat indirectly to a process material (liquid, gas, or solid) or to heat transfer material for use in a process material for use in a process unit, instead of generating steam. Process heaters are devices in which the combustion gases do not directly come into contact with process materials. Process heaters do not include units for comfort heat or space heat, food preparation for on-site consumption, or autoclaves."

Progress Energy proposes to install one auxiliary boiler rated at 99 MMBtu/hr to produce steam if required to support the Project in the future. The auxiliary boiler will be used only for startup and be limited to 1,000 hours per year of operation. The auxiliary boiler will be subject to the Boiler MACT under the "Limited use Gaseous Fuel" subcategory, which is defined as follows in 40 CFR 63.7575:

"Limited use gaseous fuel subcategory includes any watertube boiler or process heater that burns gaseous fuels not combined with any liquid or solid fuels, burns liquid fuel only during periods of gas curtailment or gas supply emergencies, has a rated capacity of greater than 10 MMBtu/hr input, and has a federally enforceable annual average capacity factor of equal to or less than 10 percent."

New or reconstructed limited use gaseous fuel boilers and process heaters must meet a CO emission limit of 400 ppmvd, corrected to three percent oxygen based on an average of three one-hour runs. The auxiliary boiler proposed for the Project will meet these requirements.

The natural gas heaters are defined as small gaseous fuel units and are not subject to the initial notification or any requirements of the Subpart DDDDD pursuant to 40 CFR 63.7506(c).

2.5 Site Layout, Structures, and Stack Sampling Facilities

A plot plan of the proposed project is presented in Figure 2-1 for the 4-on-1 combined cycle configuration, as well as the fifth stand-alone CT (a simple cycle peaking unit). The dimensions of the buildings and structures are presented in Section 6.0. Stack sampling facilities will be constructed in accordance with Rule 62-297.310(6), F.A.C.

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal, state, and local air regulatory requirements and their applicability to the Project. These requirements must be satisfied before the proposed facility can begin construction and/or operation.

3.1 National, State, and Local AAQS

The existing applicable national and State of Florida AAQS (ambient air quality standards) are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health with an adequate margin of safety, and secondary national AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in compliance with AAQS are designated as attainment areas. New sources to be located in or near these areas may be subject to more stringent air permitting requirements.

3.2 PSD Requirements

3.2.1 General Requirements

Under federal and Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed, and a pre-construction permit issued. As Florida's EPA approved State Implementation Plan (SIP) includes PSD regulations, the Florida Department of Environmental Protection (FDEP) has PSD approval authority.

A "major facility" is defined as any 1 of 28 named source categories that have the potential to emit 100 TPY or more or any other stationary facility that has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

EPA has promulgated regulations providing that certain increases above an air quality baseline concentration level of criteria pollutants such as SO_2, PM_{10}, and NO_2 would constitute significant deterioration of air quality. The EPA class designations and allowable PSD increments are presented in Table 3-1. Florida has adopted the EPA class designations and allowable PSD increments for SO_2, PM_{10}, and NO_2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 51.166, *Prevention of Significant Deterioration of Air Quality*. The State of Florida's PSD regulations are found in Rule 62-212.400, F.A.C. Major new facilities are required to undergo the following analyses related to PSD for each pollutant emitted in significant amounts (see Table 3-2):

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility also must be reviewed with respect to GEP (good engineering practice) stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 Control Technology Review

Per the control technology review PSD requirements, all applicable federal and state emission-limiting standards must be met, and that the Best Achievable Control Technology (BACT) be applied to control emissions from the source (Rule 62-212.400, F.A.C.). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in Rule 62-210.200(38), F.A.C., as:

> *(a) An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account:*

1. Energy, environmental and economic impacts, and other costs;

2. *All scientific, engineering, and technical material and other information available to the Department; and*

3. *The emission limiting standards or BACT determinations of Florida and any other state; determines is achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant.*

(b) if the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of an emissions unit or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation.

(c) Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.

(d) In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60, 61, and 63.

BACT requirements were promulgated within the framework of the PSD provisions in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in *Guidelines for Determining Best Available Control Technology (BACT)* (EPA, 1978) and in the *PSD Workshop Manual* (EPA, 1980). These guidelines were issued by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. However, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with new source performance standards (NSPS) for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and the PSD Workshop Manual was used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, EPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987, the EPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program, including the adoption of a new "top-down" approach to BACT decision making.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emission limits that have been applied elsewhere to the same or a similar source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose using it. Rejection of control alternatives may be based on technical or economic infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic, or energy impacts. The differences between the proposed facility and the facility for which the control technique was applied previously, must be justified. EPA has issued a draft guidance document on the top-down approach entitled *Top-Down Best Available Control Technology Guidance Document* (EPA, 1990). FDEP utilizes the "top-down" BACT approach.

3.2.3 Source Impact Analysis

A source impact analysis must be performed for a proposed major source subject to PSD review for each pollutant for which emissions exceed the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analyses, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models normally must be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication *Guideline on Air Quality Models (Revised, November 9th, 2005).* The source impact analysis for criteria pollutants to address compliance with AAQS and PSD Class II increments may be limited to the new source if the impacts as a result of the new source are below significance impact levels, as presented in Table 3-1.

The EPA has proposed significant impact levels for Class I areas, as follows:

Pollutant	Averaging Time	Proposed EPA PSD Class I Significant Impact Levels ($\mu g/m^3$)
SO_2	3-hour	1
	24-hour	0.2
	Annual	0.1
PM_{10}	24-hour	0.3
	Annual	0.2
NO_2	Annual	0.1

[a] $\mu g/m^3$ = micrograms per cubic meter.

Although these levels have not been officially promulgated as part of the federal PSD regulations and may not be binding for states in performing PSD reviews, the levels serve as a guideline in assessing a source's impact in a Class I area. The EPA action to incorporate Class I significant impact levels in the PSD process is part of implementing NSR (New Source Review) provisions of the 1990 CAA Amendments. Because the process of developing the regulations will be lengthy, EPA believes that the guidance concerning the significant impact levels is appropriate to assist states in implementing the PSD permit process. The FDEP has accepted the use of these significant impact levels.

Various lengths of meteorological data records can be used for impact analysis. A five-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If fewer than five years of meteorological data are used in the modeling analysis, the highest concentration at each receptor normally must be used for comparison to air quality standards.

The term "baseline concentration" refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition, in the PSD regulations as amended August 7, 1980, baseline concentration means the ambient concentration level that existed in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities that commenced construction before January 6, 1975, for SO_2 and PM(TSP) concentrations or February 8, 1988, for NO_2 concentrations, but that were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and, therefore, will affect PSD increment consumption.

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975, for SO_2 and PM(TSP) concentrations and after February 8, 1988, for NO_2 concentrations; and
2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM (TSP) and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO_2 and PM (TSP) and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM (TSP) has been set as December 27, 1977, for the entire State of Florida [Rules 62-204.200(22); 62-204.360, F.A.C.]. The minor source baseline for

NO_2 has been set as March 28, 1988 [Rule 62-204.200(22); 62-204.360, F.A.C.]. It should be noted that references to PM (TSP) are also applicable to PM_{10}.

3.2.4 Air Quality Monitoring Requirements

In accordance with requirements of 40 CFR 52.21(m) and Rule 62-212.400(7)(f), F.A.C., any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility. For a new major facility, the affected pollutants are those that the facility potentially would emit in significant amounts.

Ambient air monitoring for a period of up to one year generally is appropriate to satisfy the PSD monitoring requirements. Data for a minimum of four months are required. Existing data from the vicinity of the proposed source may be used, if it meets certain quality assurance requirements; otherwise, additional data may be needed. Guidance in designing a PSD monitoring network is provided in *Ambient Monitoring Guidelines for Prevention of Significant Deterioration* (EPA, 1987a).

The regulations include an exemption that excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that a proposed major stationary facility is exempt from the monitoring requirements with respect to a particular pollutant, if the emissions of the pollutant from the facility would cause, in any area, air quality impacts less than the *de minimis* levels presented in Table 3-2 (Rule 62-212.400-3(e), F.A.C.). If a facility's predicted impacts are less than the *de minimis* levels, then preconstruction monitoring is not required.

3.2.5 Source Information/GEP Stack Height

Source information must be provided to adequately describe the proposed facility. The general information required for this facility is presented in Section 2.0.

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant cannot be affected by a stack height that exceeds GEP or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by FDEP (Rule 62-210.550, F.A.C.). GEP stack height is defined as the highest of:

1. 65 meters (m); or
2. A height established by applying the formula:

$$Hg = H + 1.5L$$

where:

Hg = GEP stack height,

H = Height of the structure or nearby structure, and

L = Lesser dimension (height or projected width) of nearby structure(s); or

3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 kilometer (km). Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain is defined as terrain that exceeds the height calculated by the GEP stack height formula.

3.2.6 Additional Impact Analysis

In addition to air quality impact analyses, PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source [Rule 62-212.400(8), F.A.C.]. Impacts as a result of general commercial, residential, industrial, and other growth associated with the source also must be addressed. These analyses are required for each pollutant emitted in significant amounts (see Table 3-2).

3.2.7 Air Quality Related Values

An Air Quality Related Value (AQRV) analysis is required to assess the potential impact on AQRVs in PSD Class I areas. The Chassahowitzka Wilderness Area is the closest Class I area to the Bartow Power Plant, and is located about 83 km to the north of the site.

The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.

Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register, 1978).

The AQRVs include visibility, freshwater and coastal wetlands, dominant plant communities, unique and rare plant communities, soils and associated periphyton, and the wildlife dependent on these communities for habitat. Rare, endemic, threatened, and endangered species of the national park and bioindicators of air pollution (e.g., lichens) must also be evaluated.

3.3 Nonattainment Rules

FDEP has nonattainment provisions (Rule 62-212.500, F.A.C.) that apply to all major new facilities located in a nonattainment area. In addition, for major facilities that are located in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The Bartow Power Plant is located in Pinellas County, which is classified as an attainment area for all criteria pollutants. Therefore, nonattainment new source requirements are not applicable.

3.4 Emission Standards

3.4.1 New Source Performance Standards

The New Source Performance Standards (NSPS) are national emission standards, 40 CFR 60, that apply to specific categories of new sources. As stated in the 1977 Clean Air Act Amendments, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated."

EPA promulgated new NSPS for Stationary Combustion Turbines (40 CFR 60, Subpart KKKK) that commence construction after February 18, 2005. This new final rule was effective on July 6, 2006. The stationary combustion turbines subject to Subpart KKKK, 40 CFR 60 (i.e., 10 MMBtu/hr or greater), are exempt from the requirements of 40 CFR 60, Subpart GG for combustion turbines. Heat recovery steam generators and duct burners subject to Subpart KKKK are exempt from the requirements of 40 CFR 60, Subparts Da, Db and Dc for duct burners.

On October 15, 2003, EPA promulgated changes to 40 CFR 60, Subpart Kb that would exempt light oil tanks containing No. 2 light oil by virtue of its vapor pressure (FR Vol. 68, No. 199, Pages 59328-59333).

3.4.1.1 Combustion Turbine

NO_X and SO_2 emissions from all stationary CTs with a heat input at peak load equal to 10.7 gigajoules per hour (10 MMBtu/hr), based on the lower heating value of the fuel fired are limited per 40 CFR 60 Subpart KKKK. NO_X emissions for these proposed CTs (i.e., >850 MMBtu/hr) are limited by Subpart KKKK to 15 ppmvd corrected to 15-percent O_2 and 42 ppmvd corrected to 15-percent O_2 for gas and oil-firing, respectively. SO_2 emissions are limited to using a fuel with a sulfur content of no greater than 0.05 percent and 20 grains of sulfur per 100 standard cubic feet for oil and gas-firing, respectively. These requirements are summarized in Section 4.2. In addition to emission limitations, there are requirements for performance testing and monitoring in 40 CFR Subpart KKKK. There are also applicable notification, reporting, and recordkeeping requirements in the general provisions of 40 CFR Subpart A. These are summarized below:

40 CFR 60.7 Notification and Record Keeping

- (a)(1) Notification of the date of construction - 30 days after such date.
- (a)(3) Notification of actual date of initial start-up - within 15 days after such date.
- (a)(5) Notification of date which demonstrates CEM - not less than 30 days prior to date.

60.7 (b) Maintain records of all start-ups, shutdowns, and malfunctions.

- (c) Excess emissions reports – semi-annually by the 30th day following six-month period (required even if no excess emissions occur).
- (d) Maintain file of all measurements for two years.

60.8 Performance Tests

- (a) must be performed within 60 days after achieving maximum production rate but no later than 180 days after initial start-up.

(d) Notification of Performance tests at least 30 days prior to them occurring.

3.4.1.2 Duct Burner

As stated previously, the Subpart KKKK requirements have replaced the Subpart Da requirements for duct burners associated with a combined cycle project. NO_X emissions are 54 ppm at 15 percent O_2 or 0.86 lb/MW for gas-firing.

3.4.2 National Emission Standards for Hazardous Air Pollutants (MACT Standards)

As discussed in Section 2.3, EPA has promulgated MACT standards for combustion turbines. The 40 CFR 63 Subpart YYYY standard limits formaldehyde emissions to 91 parts per billion (ppb) by volume (dry) corrected to 15-percent oxygen, which is equivalent to about 220 lb/10^{12} Btu when firing natural gas and about 240 lb/10^{12} Btu when firing light oil (see Appendix A). The MACT standard could potentially apply to the Project, if during any calendar year oil use exceeds an aggregate of 1,000 hours for all turbines on the site.

3.4.3 Florida Rules

Florida has adopted the NSPS by reference in Rule 62-204.800(8), F.A.C for stationary gas turbines, duct burners, and volatile organic liquid storage vessels. Therefore, the facility is required to meet the same emissions, performance testing, monitoring, reporting, and record keeping as those described in Section 3.4.1. FDEP has authority for implementing NSPS requirements.

3.4.4 Florida Air Permitting Requirements

The FDEP regulations require any new source to obtain an air permit prior to construction. Major new sources must meet the appropriate requirements as discussed previously. Required permits and approvals for air pollution sources include PSD, NSPS, National Emission Standards for Hazardous Air Pollutants (NESHAP), Permit to Construct, and Permit to Operate. The requirements for construction permits and approvals are contained in Rules 62-4.030, 62-4.050, 62-4.210, 62-210.300(1), and 62-212.400, F.A.C. Specific emission standards are set forth in Chapter 62-296, F.A.C.

3.4.5 Local Air Regulations

The Pinellas County Department of Environmental Management is the air compliance authority. There are currently no local air quality regulations more stringent than those at the state level.

3.5 Source Applicability

3.5.1 Area Classification

The Project is located in Pinellas County, which has been designated by EPA and FDEP as an attainment area (includes unclassifiable) for all criteria pollutants. Pinellas County and surrounding counties are designated as PSD Class II areas for SO_2, PM(TSP), and NO_2. The nearest Class I area is the Chassahowitzka Wilderness Area located about 83 km (64 miles) to the north of the Site.

3.5.2 PSD Review

3.5.2.1 Pollutant Applicability

The Bartow Plant is classified as an existing major facility. A modification to an existing major facility that results in a significant net emissions increase equal to or exceeding the significant emissions rates (SER) listed in Section 62-212.400, Table 62-212.400-2, F.A.C., is classified as a major modification and will be subject to the PSD preconstruction permitting program for those pollutants that exceed the PSD SERs.

The procedures for determining applicability of the PSD permitting program to the Project are specified in Rule 62-212.400(2), F.A.C. For each regulated pollutant, PSD is triggered as a result of a modification at an existing unit if the difference between the projected actual emissions and the baseline actual emissions equals or exceeds the SER for that pollutant, as defined at Rule 62-210.200(243), F.A.C.

Net changes in emissions resulting from the Project, as shown in Table 2-1, will not exceed the PSD significant emission rates for SO_2, NO_X, PM/PM_{10}, lead and sulfuric acid mist. In fact, there will be substantial emissions decreases from existing emission levels. Therefore, PSD review is not applicable for these pollutants.

The proposed permit condition offered for consideration related to these pollutants is as follows:

> The applicant shall maintain monthly and submit to the Department on an annual basis for a period of five years from the date the Project is completed, information demonstrating in accordance with Rule 62-212.300(1)(e)(1), F.A.C. that the modification did not result in significant emissions increases of NO_X, SO_2, PM/PM_{10} , lead or sulfuric acid mist , as defined in Rule 62-210.200(234), F.A.C. The emissions computation and reporting shall be based on the requirements of Rule 62-210.370, F.A.C. and based on a tons-per-calendar-year basis.

As shown in Table 2-1, potential net emissions increase from the Project will trigger PSD review for two pollutants, CO and VOCs. Impacts from these pollutants that are predicted to be above the significant impact levels require a modeling analysis incorporating the impacts from other sources. (Note: EPA no longer requires PSD review for HAPs. The pollutants vinyl chloride, asbestos, and beryllium are no longer evaluated in PSD review because they are addressed through the NESHAP program.)

3.5.2.2 Emission Standards

The applicable NSPS for the CTs and for the duct burners is 40 CFR 60, Subpart KKKK. The proposed emissions for the Project will meet or be below the specified limits (see Section 4.2).

The MACT Standard 40 CFR 63, Subpart YYYY may potentially apply to the Project. Information available indicates that the Project will meet the proposed MACT of 91 ppbvd, corrected to 15-percent oxygen for formaldehyde.

3.5.2.3 Ambient Monitoring

Based on the potential emissions increase from the Project (see Table 2-1), a pre-construction ambient monitoring analysis is required for CO and ozone (based on VOC emissions). If the ambient impact of these pollutants is less than the applicable *de minimis* monitoring concentration (100 TPY in the case of VOC), then an exemption from the pre-construction ambient monitoring requirement is available per Rule 62-212.400(3)(e), F.A.C. As shown in Table 6-4, the Project's impacts are predicted to be below the applicable *de minimis* monitoring concentration levels for CO emissions. Therefore, pre-construction monitoring is not required to be submitted.

3.5.2.4 GEP Stack Height Impact Analysis

The GEP stack height regulations allow any stack to be at least 65 meters or 213 ft high. The stacks for the Project will be 120 ft, and, therefore, do not exceed the GEP stack height. However, as discussed in Section 6.0, Air Quality Modeling Approach, since the stack height is less than GEP, building downwash effects are considered in the modeling analysis.

3.5.3 Other Clean Air Act Requirements

The 1990 Clean Air Act Amendments established the Acid Rain Program to reduce the release of acidic deposition precursors, SO_2 and NO_X. EPA's final regulations were promulgated on January 11, 1993, and included permit provisions (Part 72), allowance system (Part 73), continuous emission monitoring (Part 75), excess emission procedures (Part 77), and appeal procedures (Part 78).

This Acid Rain Program applies to all existing and new utility units except those serving a generator less than 25 MW, existing simple cycle CTs, and certain non-utility facilities; units which fall under the program are referred to as "affected units." The EPA regulations are applicable to the Project for the purposes for obtaining a permit and allowances, as well as emission monitoring. New units are required to obtain Acid Rain permits by submitting a complete application 24 months before the date on which the unit commences operation (e.g., first fire).

The Acid Rain permit would require the units to hold SO_2 emission allowances. These are market-based financial instruments that are equivalent to a prescribed amount of SO_2 emissions. Allowances can be sold, purchased, or traded. Emission limitations established in the Acid Rain Program are presumed to be less stringent than BACT for new units.

Continuous emission monitoring (CEM) for SO_2 and NO_X is required for gas fired and oil fired affected units. When an SO_2 CEM is selected to monitor SO_2 mass emissions, a flow monitor is also required. Alternately, SO_2 emissions may be determined using procedures established in Appendix D, 40 CFR 75 (flow proportional oil sampling or manual daily oil sampling). CO_2 emissions must also be determined either through a CEM (e.g., as a diluent for NO_X monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified (Part 75, Appendices A through I). The acid rain CEM requirements including QA/QC procedures are, in general, more stringent than those specified in the

NSPS. New units are required to meet these requirements by either January 1, 1995, or not later than 90 days after the unit commences commercial operation, which ever is later.

Finally, on May 12, 2005, EPA promulgated a rule to reduce emissions of SO_2 and NO_X from electric generating units located in 29 eastern states, including Florida. This rule was codified as a revision to Subpart G of 40 CFR Part 51. The stated objective of the Clean Air Interstate Rule (CAIR), is to assist eastern states in achieving attainment with the new, more stringent $PM_{2.5}$ and the 8-hour ozone National Air Quality Standards (NAAQS) by reducing precursor emissions in upwind areas. Progress Energy is proposing this Project, in part, to allow it to reduce NO_X and SO_2 emissions such that it will not have to buy allowances under the CAIR program. Compliance of the Bartow site with Florida's CAIR implementing regulations will be addressed following their finalization, in a separate subsequent application package as required by rules that the Department is promulgating in 2006.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 Applicability

Per the PSD regulations, the Project is required to undergo a control technology review for emissions of CO and VOCs (see Section 3.0). The maximum potential annual emissions of these pollutants from the proposed Siemens F-Class CTs are summarized in Table 2-1.

This section presents the applicable NSPS and the proposed BACT for these pollutants. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as consideration of EPA's current policy guidelines requiring a "top-down" approach. A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies. The analysis must, by definition, be specific to the Project (i.e., case-by-case).

4.2 New Source Performance Standards

The applicable NSPS for CTs are codified in 40 CFR 60, Subpart KKKK and summarized in Appendix B. The applicable NSPS emission limits for NO_X are as follows:

New, modified, or reconstructed turbine firing natural gas	> 850 MMBtu/hr	15 ppm at 15-percent O_2 or 54 ng/J of useful output (0.43 lb/MWh)
New, modified, or reconstructed turbine firing fuels other than natural gas	> 850 MMBtu/hr	42 ppm at 15-percent O_2 or 160 ng/J of useful output (1.3 lb/MWh)

The proposed NO_X emission limits for the Project in combined- and simple-cycle mode will be equivalent to the NSPS when firing natural gas and distillate oil. For turbines located in a continental area such as the Project, the following NSPS emission limits for SO_2 apply:

- Must not cause to be discharged into the atmosphere from the subject stationary combustion turbine any gases which contain SO_2 in excess of 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh) gross output, or

- Must not burn in the subject stationary combustion turbine any fuel which results in emissions in excess of 26 ng SO_2/J (0.060 lb SO_2/MMbtu) heat input. If your turbine simultaneously fires multiple fuels, each fuel must meet this requirement.

The above standards translate into the following fuel sulfur content limitations:

- For oil-firing, less than or equal to 0.05 percent sulfur by weight

- For natural gas-firing, less than or equal to 20 grains of sulfur per 100 standard cubic feet

The applicable NO_X emission limit per 40 CFR 60, Subpart KKKK for the duct burner is as follows:

Heat recovery units operating independent of the combustion turbine	All sizes	54 ppm at 15-percent O_2 or 110 ng/J of useful output (0.86 lb/MWh)

The combined CT and duct burner emissions rate with SCR of 18 ppmvd corrected to 15-percent O_2 is three times lower than the applicable NSPS.

4.3 Best Available Control Technology (BACT)

4.3.1 Overview Of Proposed BACT

In recent permitting actions, BACT for heavy-duty industrial gas turbines has been determined to be achieved through good combustion practices for minimizing CO and VOC emissions. The BACT proposed for the Project is consistent with these permits and is summarized below:

CO Emissions

- 4 ppmvd at 15 percent oxygen, when firing natural gas at baseload to 70-percent load;
- 10 ppmvd at 15 percent oxygen, when firing natural gas at 70 percent load to 60-percent load;
- 9 ppmvd at 15 percent oxygen when firing natural gas with duct firing; and
- 30 ppmvd at 15 percent oxygen, when firing distillate oil at baseload to 70 percent load.

VOC Emissions

- 1 ppmvd at 15 percent oxygen, when firing natural gas at baseload to 70-percent load,
- 4 ppmvd at 15 percent oxygen, when firing natural gas at 70 percent load to 60-percent load,
- 2 ppmvd at 15 percent oxygen when firing natural gas with duct firing, and
- 10 ppmvd at 15 percent oxygen firing distillate oil.

4.3.2 Carbon Monoxide

4.3.2.1 Technology Description

Emissions of CO are dependent on the combustor design, which is a result of the manufacturer's operating specifications, including the air-to-fuel ratio, staging of combustion, and the amount of water injected. The CTs proposed for the Project have designs to optimize combustion efficiency and minimize NO_X emissions to the lowest achievable using DLN combustion technology while maintaining low CO emission levels.

For the Project, the following alternatives were evaluated as BACT:

1. Combustion controls, and
2. Oxidation catalyst at 2 ppmvd CO emission rate.

There are two alternatives for installing an oxidation catalyst. One would be the installation of a catalyst prior to the HRSG to reduce CO emissions from the turbine, but the duct burners would be uncontrolled. The second would be the installation of an oxidation catalyst within the HRSG, which would control the CO emissions from both the turbines and the duct burners. The capital cost for an oxidation catalyst and its technical feasibility is no different in considering simple or combined cycle operation.

4.3.2.2 Impact Analysis

Economic-The estimated capital cost for an oxidation catalyst installed in the HRSG is $1.55 million. The annualized cost of a CO oxidation catalyst is $693,000. The resulting cost effectiveness is approximately $4,772 per ton of CO removed for gas and oil firing. No costs are associated with combustion techniques, since they are inherent in the design.

Environmental-The air quality impacts of both oxidation catalyst control and combustion design control techniques are below the significant impact levels for CO. Therefore, no significant environmental benefit would be realized by the installation of a CO catalyst. Moreover, the air quality impacts, at the proposed CT emission rate, are predicted to be much less than the PSD significant impact levels. The maximum CO impacts are less than 0.1 percent of the applicable AAQS and there are no secondary benefits, such as reductions in ozone precursors and acidic deposition.

In contrast, the installation of an oxidation catalyst would create additional back pressure on the turbine that will result in lost electricity generation that would otherwise be available and thus replaced by older, less efficient technology. The end result is an increase in emissions of CO and other regulated emissions from those other sources.

Energy--An energy penalty would result from the pressure drop across the catalyst bed. A pressure drop of about 1.5 to 2 inches of water gauge would be expected. A catalyst back pressure of 2 inches would result in an energy penalty of about 3.4 million kWh/yr. The energy penalties are sufficient to supply the electrical needs of about 281 residential customers for a year. To replace this lost energy, about 3.4×10^{10} Btu/yr or about 35 million cf/yr of natural gas would be required.

4.3.2.3 Proposed BACT and Rationale

Combustion design is proposed as BACT, as there are adverse technical and economic consequences of using catalytic oxidation on CTs. The proposed BACT emission rates for CO will not exceed:

- 4 ppmvd at 15 percent oxygen, when firing natural gas at baseload to 70-percent load,
- 10 ppmvd at 15 percent oxygen, when firing natural gas at 70 percent load to 60-percent load,
- 9 ppmvd at 15 percent oxygen when firing natural gas with duct firing, and
- 30 ppmvd at 15 percent oxygen, when firing distillate oil at baseload to 70-percent load.

Catalytic oxidation is considered unreasonable for the following reasons:

1. Catalytic oxidation will not produce measurable reduction in the air quality impacts,

2. The economic impacts are significant (i.e., the capital cost is $1.55 million, with an annualized cost of about $693,000 per year per unit), and

3. Recent projects in Florida and EPA Region IV have been authorized with BACT emission limits of similar magnitude.

Combustion design is proposed as BACT as a result of the technical and economic consequences of using catalytic oxidation on CTs. Catalytic oxidation is considered unreasonable, since it will not produce a measurable reduction in the air quality impacts. Indeed, recent BACT decisions for similar advanced CTs have set limits in the 9 to 30 ppmvd range when firing natural gas and distillate oil. The cost of an oxidation catalyst would be significant and not be cost effective given the maximum proposed emission limits.

The cost effectiveness calculations are significantly understated if the actual emission performance is considered. The actual CO emissions performance of the Siemens F-Class turbines is historically much less than the guaranteed rates. This is a direct result of the turbine manufacturers and duct burner vendors including significant margins on CO and VOC emissions to assure that NO_X emission guarantees can be achieved in the combustion systems.

4.3.3 Volatile Organic Compounds

Volatile Organic Compounds (VOCs) will be emitted by the CTs as a result of incomplete combustion. The use of combustion technology and clean fuels will be implemented so that VOC emissions when firing natural gas will not exceed the following:

- 1 ppmvd at 15 percent oxygen, when firing natural gas at baseload to 70-percent load,
- 4 ppmvd at 15 percent oxygen, when firing natural gas at 70 percent load to 60-percent load,
- 2 ppmvd at 15 percent oxygen when firing natural gas with duct firing, and
- 10 ppmvd at 15 percent oxygen firing distillate oil.

These emission levels are similar to the BACT emission levels established for other comparable sources. Combustion controls and the use of clean fuels have been overwhelmingly approved as

BACT for CO and VOC emissions from CTs. The further reduction of emissions would not result in a significant benefit.

A review of the BACT/LAER Information System (BLIS) did not locate any oxidation catalysts on natural gas fired combustion turbines to limit emissions of VOCs. Therefore, an oxidation catalysts' vendor was contacted to determine the typical VOC removal with oxidation catalyst controls(i.e., primarily used for CO LAER in nonattainment areas) and was informed that the VOC removal in a combustion turbine application was in the 30 to 40 percent range. The cost effectiveness calculation is presented below:

VOC Cost Effectiveness Calculations

2.5	lb/hr gas firing at baseload
4.5	lb/hr gas firing at baseload w/duct firing
4.6	lb/hr gas firing power augmentation with duct firing
25.4	lb/hr oil firing
25.4	TPY
40.00%	Removal
10.16	TPY removal
$68,238	per ton VOC removed
90.00%	Removal
22.86	TPY removed
$30,328	per ton VOC removed

At 40 percent removal, the cost effectiveness of an oxidation catalyst is over $68,000 per ton of VOC removed. Assuming that 90 percent reduction were available at the same cost, the cost effectiveness is over $30,000 per ton of VOC removed.

4.3.4 Auxiliary Boiler

The proposed BACT for the auxiliary boiler is good combustion practices to limit emissions of CO and VOC. Although not subject to BACT, natural gas is the cleanest fossil fuel and will minimize the emissions of PM and SO_2 to emission levels recognized as BACT. The auxiliary boiler will also limit NOx emissions using low-NO_X burners. CO emissions will meet the requirements of 40 CFR 60 Subpart DDDDD. The auxiliary boiler will be limited to 1,000 hours per year.

5.0 AMBIENT MONITORING ANALYSIS

The PSD rules require that an air quality analysis be conducted for each criteria and non-criteria pollutant subject to regulation under the Clean Air Act before a major stationary source is constructed. Criteria pollutants are those pollutants for which AAQS have been established. Non-criteria pollutants are those pollutants that may be regulated by emission standards, for which AAQS have not been established. This analysis may be performed by the use of modeling and/or by monitoring the air quality. In addition, if EPA has not established an acceptable ambient monitoring method for the pollutant, monitoring is not required.

Based on the potential emissions from the Project (see Table 2-1), pre-construction ambient monitoring analyses for CO and ozone (based on VOC emissions), may be required as part of an application. However, ambient monitoring analyses are not required if it can be demonstrated that the proposed source's maximum air quality impacts will not exceed the PSD *de minimis* concentration levels and, for ozone (based on VOC emissions), VOC emissions of 100 TPY.

As shown in Section 6.9, the Project's maximum CO impacts are predicted to be below the PSD *de minimis* eight-hour average CO concentration of 575$\mu g/m^3$ and the Project's net VOC emissions are less than 100 TPY. Therefore, an exemption from the preconstruction monitoring requirement is requested.

6.0 AIR QUALITY IMPACT ANALYSIS

6.1 Significant Impact Analysis Approach

As discussed in Section 3, the Project results in increases in CO and VOC emissions above the PSD significant emission levels and, therefore, triggers PSD review for only those two pollutants. For CO, a source impact analysis is also required. Because existing EUSGU Nos. 1, 2 and 3 are to be retired, the net emissions increases for the other criteria pollutants are below the PSD significant emission levels. As such, PSD review for SO_2, NO_X, and PM_{10} is not triggered. However, because the proposed emission sources will have stack and operating parameters that are different from the existing boiler unit stacks, an air modeling analysis was conducted for these non-PSD pollutants to demonstrate that such impacts will be below the respective allowable PSD Class II increments. Because the Bartow Power Plant is relatively isolated from other PSD increment-affecting background emission sources, the proposed emissions from the Project alone, without the offsetting emissions from the existing EUSGUs, were considered sufficient to demonstrate whether compliance would be achieved. The heights above grade of the existing boiler unit stacks are 300 ft, while the proposed CT/HRSG stack and simple cycle stacks are at 120 ft.

For CO, the general modeling approach for this Project followed EPA and FDEP modeling guidelines for determining compliance with AAQS and PSD increments. A significant impact analysis was performed to determine whether the Project's emission and/or stack configuration would result in predicted impacts that are greater than the EPA significant impact levels at any location beyond the plant's restricted boundaries. If these maximum impacts were found to be greater than the significant impact levels, an additional analysis would be performed with the emission reductions from the existing boiler units.

If the Project-only impacts are above the significant impact levels in the vicinity of the facility, then two additional and more detailed air modeling analyses would be performed. The first additional analysis demonstrates compliance with federal and Florida AAQS, and the second analysis demonstrates compliance with allowable PSD Class II increments.

Generally, if a project undergoing the modification is located within 200 km of a PSD Class I area, then a significant impact analysis is also performed to evaluate the impact due to the Project alone at the PSD Class I area. The maximum predicted impacts are compared to EPA's proposed significant impact levels for PSD Class I areas. These recommended levels have never been promulgated as rules but are the currently accepted criteria to determine whether a proposed Project should perform a more detailed modeling analysis at a PSD Class I area.

If the Project-only impacts at the PSD Class I area are above the proposed EPA PSD Class I significant impact levels, then an analysis is performed to demonstrate compliance with allowable PSD Class I increments at the PSD Class I area.

The nearest PSD Class I area is the Chassahowitzka National Wilderness Area (NWA), located approximately 83 kilometers (km) to the north of the Bartow Power Plant. While pollutant impacts in the vicinity of the Bartow Power Plant site can be largely affected by the height of release and stack operating parameters of the various emission sources, impacts at the Chassahowitzka NWA, are more dependent on pollutant loading. Since the Project involves the shutdown of the existing EUSGUs, substantial emission reductions will be realized for SO_2, NO_X, PM_{10} and sulfuric acid mist (SAM). The magnitude of these emission reductions are as follows:

- SO_2: 24,350 tons per year (TPY);
- NOx: 852 TPY;
- PM_{10}: 146 TPY; and
- SAM: 351 TPY.

As such, predicted impacts of the non-PSD pollutants are expected to decrease at the Chassahowitzka PSD Class I area, and no additional modeling was performed to assess impacts for those pollutants at that area. However, CO impacts were predicted for the project at the Chassahowitzka NWA PSD Class I area because PSD review is required for that pollutant.

Air impacts were not predicted at other PSD Class I areas since they are located more than 200 km from the Bartow Power Plant.

6.2 Pre-construction Monitoring Analysis Approach

The modeling approach followed EPA and FDEP modeling guidelines for evaluating a Project's impacts relative to the *de minimis* monitoring levels to determine the need to submit ambient monitoring data prior to construction. Current FDEP policies stipulate that the predicted highest annual average and highest short-term concentrations are to be compared to the applicable *de minimis* monitoring levels. This was previously addressed in Section 5.0.

6.3 Air Modeling Analysis Approach

6.3.1 General Procedures

As stated in the previous sections, air modeling analyses are required to determine if the Project's impacts are predicted to be greater than the significant impact levels and *de minimis* monitoring levels for each pollutant that is emitted above the significant emission rate. These analyses consider the Project's impacts alone. Air quality impacts are predicted using five years of meteorological data and selecting the highest predicted ground-level concentrations for comparison to the significant impact levels and *de minimis* monitoring levels.

To predict the maximum annual and short-term concentrations for the Project, the modeling approach was divided into screening and refined phases. Concentrations are predicted for the screening phase using a coarse receptor grid and a five-year meteorological data record. If the highest concentration is predicted at a receptor that lies in an area where the receptor spacing is more than 100 m, then a refined analysis is performed in that area using a receptor grid of greater resolution. Modeling refinements are performed using a receptor spacing of 100 m with a receptor grid centered on the screening receptor at which the maximum concentration was predicted. The air dispersion model is then executed with the refined grid for the entire year of meteorology during which the screening concentration occurred.

If the Project's impacts are greater than the significant impact levels, the air modeling analyses must consider other nearby sources and background concentrations to predict a total concentration for comparison to AAQS and PSD Class II increments.

Generally, when using five years of meteorological data for the analysis, the highest annual and the highest, second-highest (HSH) short-term (i.e., 24 hours or less) concentrations are compared to the applicable AAQS and allowable PSD increments. The HSH concentration is calculated each year for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

The HSH approach is consistent with AAQS and allowable PSD increments, which permit a short-term average concentration to be exceeded once per year at each receptor.

It should be noted that for determining compliance with the 24-hour AAQS for PM_{10}, the highest of the sixth-highest concentration predicted in five years (i.e., H6H), instead of the HSH concentration predicted for each year, is used to compare to the applicable 24-hour AAQS.

The AAQS analysis is a cumulative source analysis that evaluates whether the concentrations from all sources will comply with the AAQS. These concentrations include the modeled impacts from sources at the Project Site and from other nearby facility sources added to a background concentration. The background concentration accounts for sources not included in the modeling analysis.

The PSD Class II analysis is a cumulative source analysis that evaluates whether the concentrations for increment-affecting sources will comply with the allowable PSD Class II increments. These concentrations include the modeled impacts from PSD increment-affecting sources at the Project Site, plus nearby PSD increment-affecting sources at other facilities.

6.3.2 PSD Class I Analysis

For each pollutant for which a significant impact is predicted at the PSD Class I area, a PSD Class I analysis is required. The PSD Class I analysis is a cumulative source analysis that evaluates whether the concentrations for increment-affecting sources located within 200 km of the PSD Class I area will comply with the allowable PSD Class I increments. These concentrations include the impacts from PSD increment-affecting sources at the Project Site, plus the impacts from PSD increment-affecting sources at other facilities.

As previously discussed, since the Project did not trigger review for pollutants for which PSD Class I increments are established (i.e., SO_2, PM_{10}, NO_X), no additional modeling was performed to assess impacts for those pollutants. However, CO impacts were predicted for the Project at the PSD Class I area since CO emissions triggered PSD review.

6.4 Model Selection

The selection of an air quality model to predict air quality impacts for the proposed project was based on the ability of the model to simulate impacts in areas surrounding the projects as well as at the PSD Class I areas. The American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model was selected since the EPA and FDEP recommend its use to predict pollutant concentrations at receptors located within 50 km from a source.

The AERMOD dispersion model (Version 04300) is available on the EPA's Internet web site, Support Center for Regulatory Air Models (SCRAM), within the Technical Transfer Network (TTN).

On November 9, 2005, the EPA implemented AERMOD into its *Guideline of Air Quality Models (Appendix W to 40 CFR Part 51)* as the recommended model for regulatory modeling applications. The FDEP is allowing the use of AERMOD for air permitting projects as a replacement for the Industrial Source Complex Short-Term Model (ISCST3), which will no longer be in effect as of December 2006.

The AERMOD model calculates hourly concentrations based on hourly meteorological data. The AERMOD model is applicable for most applications since it is recognized as containing the latest scientific algorithms for simulating plume behavior in all types of terrain. For evaluating plume behavior within the building wake of structures, the AERMOD model incorporates the Plume Rise Model Enhancement (PRIME) downwash algorithm developed by the Electric Power Research Institute (EPRI). AERMOD can predict pollutant concentrations for averaging times of annual and 24, 8, 3, and 1 hour.

For this analysis, the EPA regulatory default options were used to predict all maximum impacts. These options include:

- Final plume rise at all receptor locations,
- Stack-tip downwash,
- Buoyancy-induced dispersion,
- Default wind speed profile coefficients,
- Default vertical potential temperature gradients, and

- Calm wind processing.

At distances beyond 50 km from a source, the CALPUFF model is recommended for use by the EPA and the Federal Land Manager (FLM). The CALPUFF model is a long-range transport model applicable for estimating the air quality impacts in areas that are more than 50 km from a source. The CALPUFF model is maintained by the EPA on the SCRAM internet website. The methods and assumptions used in the CALPUFF model are based on the latest recommendations for modeling analysis as presented in the following reports:

- The Interagency Workgroup on Air Quality Models (IWAQM), *Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998); and

- The *Federal Land Manager's Air Quality Relative Values Workgroup (FLAG) Phase I Report* (December, 2000).

The CALPUFF model was used to assess the Project's impact on CO concentration levels at the Class I area. See Appendix C for a more detailed description of the assumptions and methods used for the CALPUFF model.

6.5 Meteorological Data

Meteorological data used in the AERMOD model to determine air quality impacts consisted of a concurrent five-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) office located at the Tampa International Airport. Concentrations were predicted using five years of hourly meteorological data from 2001 through 2005. The NWS office at Tampa is located approximately 13.7 km (8.5 miles) north-northwest of the site. The FDEP considers this station to have surface meteorological data representative of the project site. The data for these stations were processed by FDEP into a format that can be input to the AERMOD model using the meteorological preprocessor program AERMET.

CALMET, the meteorological preprocessor to CALPUFF, was used to develop a three-dimensional wind field necessary to perform the air modeling analysis to evaluate pollutant impacts at each PSD Class I area. The modeling domain consisted of a rectangular three-dimensional grid that extends from approximately 24 to 32 degrees N latitude and from 80 to 90 degrees W longitude. The modeling domain includes the following meteorological and land use parameters:

- Surface weather data,
- Upper air data,
- A 1-degree land use data,
- A 1-degree Digital Elevation Model (DEM) terrain data,
- Mesoscale Model - Generation 5 (MM5) data (for initializing the wind field), and
- Hourly precipitation data.

The CALMET-developed data for the years 2001 to 2003 were obtained from FDEP. These data were developed from the VISTAS program to assess regional haze from sources under the BART regulations.

6.6 Source Data

6.6.1 Project

Summaries of the criteria pollutant emission rates, physical stack, and stack operating parameters for the repowered units used in the air modeling analysis are presented in Section 2. In an effort to obtain the maximum air quality impacts for a range of possible operating conditions, a range of operating loads and ambient temperatures were modeled.

For Phase 1, a total of 6 modeling scenarios were considered for the simple cycle operation of two CT units firing fuel oil for the following conditions:

- 100 percent operating load (35 and 95°F);
- 80 percent operating load (20 and 105°F); and
- 65 percent operating load (20 and 105°F).

Because the pollutant emissions are higher when firing fuel oil, impacts were not predicted when firing natural gas for Phase 1. The air quality impacts due to two natural gas-fired heaters were determined separately, and were added to the maximum impacts due to the two CT units to obtain the total impacts for Phase 1.

For Phase 2, a total of 6 modeling scenarios were considered for the combined cycle operation for four CTs and simple cycle operation for one CT for the following conditions:

- 100 percent operating load (35 and 95°F);
- 80 percent operating load (20 and 105°F); and
- 65 percent operating load (20 and 105°F).

For the Phase 1 modeling, the AERMOD model was used to predict maximum concentrations for the annual and 24-, 8-, 3-, and 1-hour averaging times in the vicinity of the proposed project using a generic emission rate of 10 g/s. For the Phase 2 modeling, the AERMOD model was used to predict maximum concentrations for pollutant-specific averaging times in the vicinity of the proposed project using pollutant-specific worse-case emission rates from fuel oil firing. The load analyses for Phase 2 included five natural gas-fired heaters and an auxiliary boiler. For PM_{10} only, the offsetting emissions due to the existing Boilers 1, 2 and 3 (which are to be retired as a result of the proposed project) were included in the analysis.

6.6.2 AAQS and PSD Class II Sources

The maximum pollutant impacts for the Project are predicted to be less than the significant impact levels for CO. As a result, cumulative source impact analyses are not required to demonstrate compliance with the CO AAQS.

6.7 Building Downwash Effects

All significant building structures in the Project area were identified by the site plot plan. The building structures were processed in the EPA Building Profile Input Program [(BPIP), Version 04274] to determine direction-specific building heights and widths for each 10-degree azimuth direction for each source that was included in the modeling analysis. A listing of dimensions for each structure is presented in Table 6-1. BPIP input and output files and figures showing the buildings and structures at the site are presented in Appendix D.

6.8 Receptor Locations

To determine the maximum impact for all pollutants and averaging times in the vicinity of the repowered unit, concentrations were predicted at and beyond the proposed project site fence line. For predicting pollutant impacts beyond the fence line, a square-shaped array of receptors was used. The array of receptors was centered on the UTM easting and northing coordinates of (342,350, 3,082,550) m in NAD 27. This point is located between the existing boiler stacks and the easternmost proposed CT units.

Along the fence line, receptors were spaced at 50-meter intervals. Beyond the fence line, receptors were located at the following intervals and distances from the fence line:

- Every 100 m from the fence line to 2 km;
- Every 250 m from 2 to 4 km;
- Every 500 m from 4 to 6 km; and
- Every 1,000 m from 6 to10 km.

Overall, 3,095 receptors were used in the analysis to determine the maximum impacts for the Project. Figures showing the receptor locations used in the modeling are presented in Appendix D.

For determining the Project's maximum CO impacts at the PSD Class I area, pollutant concentrations were predicted in an array of 113 discrete receptors located at the PSD Class I area of the Chassahowitzka NWA. The receptors were provided by the National Park Service (NPS).

6.9 Model Results

The maximum pollutant concentrations predicted for the Project are given in Tables 6-2 to 6-4. The maximum concentrations predicted by operating load and range of ambient temperatures for Phase 1 for the simple cycle operation firing fuel oil are presented in Table 6-2 and in Table E-1. The maximum concentrations predicted by operating load and range of ambient temperatures in Phase 2 for the combined cycle operation and simple cycle operation firing fuel oil are presented in Table 6-3. The overall maximum pollutant concentrations, compared to the PSD significant impact levels and allowable PSD Class II increments, are presented in Table 6-4.

As shown in Table 6.4, the maximum concentrations due to the repowered units for Phase 1 are predicted to be less than the PSD significant impact levels for CO and the other non-PSD pollutants. For Phase 2, the maximum concentrations due to the repowered units are predicted to be less than the PSD significant impact levels for CO and, as such, additional modeling is not required for that pollutant.

The maximum and second-highest short-term impacts for pollutants that did not trigger PSD review (i.e., SO_2, PM_{10}, and NO_2) were compared to the allowable PSD Class II increments in Table 6-4. As shown, the maximum impacts due to the repowered units firing fuel oil, with the proposed gas heaters and auxiliary boiler emissions, are predicted to be less than the applicable PSD Class II increments.

As a result, the future Project's impacts are predicted to comply with the allowable PSD Class II increments. Similarly, the Project's impacts are predicted to comply with the AAQS, which are greater in magnitude than the allowable PSD Class II increments.

Summaries of the maximum impacts for the proposed repowering project, including locations and time periods, are presented in Appendix E.

7.0 ADDITIONAL IMPACT ANALYSIS

This section presents the impacts the Project will have on vegetation, soils, visibility, both in the vicinity of the Bartow Plant and at the PSD Class I area of the Chassahowitzka National Wilderness Area, and addresses direct growth resulting from the Project.

7.1 Impacts to Soils, Vegetation, and Visibility in the Vicinity of the Plant

As discussed in Section 3, the Project results in increases in CO and VOC emissions above the PSD significant emission levels and, therefore, triggers PSD review for those pollutants. The maximum CO impacts for the Project for Phase 1 and Phase 2 are predicted to be less than the PSD significant impact levels and, therefore, well below the AAQS. In addition, for pollutants not triggering PSD review (i.e., SO_2, PM_{10}, and NO_X), the maximum air quality impacts for the Project for Phase 1 are also predicted to be less than the PSD significant impact levels and, therefore, well below the AAQS. For Phase 2, the maximum predicted air quality impacts for the Project for Phase 2 for pollutants not triggering PSD review are expected to be below the allowable PSD Class II increments and, therefore, well below the AAQS.

VOC and NO_X emissions are precursors to the formation of ozone. Ozone is formed down-wind from emission sources when VOC and NO_X emissions from a facility react in the presence of sunlight. Because of these reactions, current steady-state regulatory models, such as AERMOD cannot predict what effect the proposed Project's emissions of VOCs will have on ambient ozone concentrations from either a local or regional scale.

Background (without man-made sources) ambient concentrations of ozone are normally in the range of 20 to 39 $\mu g/m^3$ (0.01 to 0.02 ppm) (Heath, 1975). Ozone can cause various damage to broad-leaved plants including: tissue collapse, interveinal necrosis and markings on the upper surface of leaves known as stippling (pigmented yellow, light tan, red brown, dark brown, red, or purple), flecking (silver or bleached straw white), mottling, chlorosis or bronzing, and bleaching. Ozone can also stunt plant growth and bud formation. On certain plants such as citrus, grape, and tobacco, it is common for leaves to wither and drop early. A literature review suggests that exposure for four hours at levels of 0.04 to 11.0 ppm of ozone will result in plant injury for sensitive plants. The extent of the injury depends on the plant species and environmental conditions prior to and during exposure.

Given that the ozone measurements in the region comply with the AAQS and the increase in VOC emissions for the Project represents less than a one percent change in regional VOC emissions, no adverse effects on vegetation due to the Project are expected.

Since the AAQS are designed to protect the public welfare, including effects on soils and vegetation, no detrimental effects on soils should occur in the vicinity of the Bartow Plant due to the Project. In addition, since the emissions of all visibility impairing pollutants (i.e., SO_2, PM_{10} and NO_X) will decrease for this Project, no detrimental effects on near-field visibility are expected.

7.2 Impacts to Soils, Vegetation, and Visibility in the Vicinity of the Plant

Rule 62-212.400(4)(e), F.A.C., states that an application must include information relating to the air quality impacts of, and the nature and extent of all general, residential, commercial, industrial and other growth which has occurred since August 7, 1977, in the area the facility or modification would affect. This growth analysis considers air quality impacts due to emissions resulting from the industrial, commercial, and residential growth associated with the proposed modification at the Bartow Plant. This information is consistent with the EPA Guidance related to this requirement in the *Draft New Source Review Workshop Manual* (EPA, 1990).

In general, there has been minimal growth around the Bartow Power Plant since 1977. Additional growth in the area affected by the plant, as a direct result of the proposed modification, is not expected.

Construction of the Project will occur over a 31-month period (including startup), requiring an average of approximately 300 workers during that time. It is anticipated that many of these construction personnel will commute to the site. Additional operational workers once the Project is completed are not expected.

There are also expected to be no air quality impacts due to associated commercial and industrial growth given the location of the existing Bartow Power Plant. The existing commercial and industrial infrastructure should be adequate to provide any support services that the Project might require and would not increase with the operation of the Project.

7.3 Additional Impact Analysis on the PSD Class I Area of the Chassahowitzka NWA

The analysis presented in this section addresses the potential impacts on vegetation, soils, and wildlife of the Chassahowitzka NWA Class I area due to the proposed modification of the Bartow Power Plant. The Chassahowitzka NWA is located approximately 83 km to the north of the Bartow Power Plant.

7.3.1 Soil, Vegetation, and AQRV Analysis Methodology

An AQRV analysis was conducted to assess the potential risk to AQRVs of the Chassahowitzka NWA due to the proposed emissions from the Project. The U.S. Department of the Interior in 1978 administratively defined AQRVs to be:

> *All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality.*
>
> *Important attributes of an area are those values or assets that make an area significant as a national monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside (Federal Register, 1978).*

Except for visibility, AQRVs were not specifically defined. However, odor, soil, flora, fauna, cultural resources, geological features, water, and climate generally have been identified by land managers as AQRVs. Since specific AQRVs have not been identified for the Chassahowitzka NWA, this AQRV analysis evaluates the effects of air quality on general vegetation types and wildlife found in the Chassahowitzka NWA.

Vegetation type AQRVs and their representative species types have been defined by the USFWS as:

- Marshlands - black needlerush, saw grass, salt grass, and salt marsh cordgrass
- Marsh Islands - cabbage palm and eastern red cedar
- Estuarine Habitat - black needlerush, salt marsh cordgrass, and wax myrtle
- Hardwood Swamp - red maple, red bay, sweet bay, and cabbage palm
- Upland Forests - live oak, scrub oak, longleaf pine, slash pine, wax myrtle, and saw palmetto

- Mangrove Swamp - red, white, and black mangrove

Wildlife AQRVs have been identified as endangered species, waterfowl, marsh and waterbirds, shorebirds, reptiles, and mammals.

The maximum CO pollutant concentrations predicted for the Project in the Chassahowitzka NWA are presented in Table 7-1. These results were compared with effect threshold limits for both vegetation and wildlife as reported in the scientific literature. A literature search was conducted that specifically addressed the effects of air contaminants on plant species reported to occur in the Chassahowitzka NWA. While the literature search focused on such species as cabbage palm, eastern red cedar, lichens, and species of the hardwood swamplands and mangrove forest, no specific citations that addressed these species were found. It is recognized that effect threshold information is not available for all species found in the Chassahowitzka NWA, although studies have been performed on a few of the common species and on other similar species that can be used as indicators of effects.

7.3.2 Impacts to Soils

For soils, the potential and hypothesized effects of atmospheric deposition include:

- Increased soil acidification,
- Alteration in cation exchange,
- Loss of base cations, and
- Mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

The soils of the Chassahowitzka NWA are generally classified as histosols. According to the U.S. Department of Agriculture (USDA) Soil Surveys of Citrus and Hernando Counties, nine soil complexes are found in the Chassahowitzka NWA. These include Aripeka fine sand, Aripeka-Okeelanta-Lauderhill, Hallendale-Rock outcrop, Homosassa mucky fine sandy loam, Lacooche, Okeelanta mucks, Okeelanta-Lauderdale-Terra Ceia mucks, Rock outcrop-Homosassa-Lacoochee, and Weekiwachee-Durbin mucks (Porter, 1996). The majority of the soil complexes found in the Chassahowitzka NWA are inundated by tidal waters, contain a relatively high organic matter content, and have high buffering capacities based on their CEC, base saturation, and bulk density. The regular flooding of these soils by the Gulf of Mexico regulates the pH and any change in acidity in the soil would be buffered by this activity. Therefore, they would be relatively insensitive to atmospheric inputs. However, Terra Ceia, Okeelanta, and Lauderdale freshwater mucks are present along the eastern border of the Chassahowitzka NWA, and may be more sensitive to atmospheric sulfur deposition (Porter, 1996). Although not tidally influenced, these freshwater mucks are highly organic and, therefore, have a relatively high intrinsic buffering capacity.

The relatively low sensitivity of the soils to atmospheric inputs coupled with the extremely low ground-level pollutant concentrations due to the proposed project at the Chassahowitzka NWA precludes any significant impact on soils.

7.3.3 Impacts to Vegetation

In general, the effects of air pollutants on vegetation occur primarily from SO_2, NO_2, O_3, and PM. Effects from minor air contaminants, such as fluoride (F), chlorine, hydrogen chloride, ethylene, ammonia, hydrogen sulfide, CO, and pesticides, have also been reported in the literature. The effects of air pollutants are dependent both on the concentration of the contaminant and the duration of the exposure. The term "injury," as opposed to damage, is commonly used to describe all plant responses to air contaminants and will be used in the context of this analysis. Air contaminants are thought to interact primarily with plant foliage, which is considered to be the major pathway of exposure. For purposes of this analysis, it was assumed that 100 percent of each air contaminant of concern is accessible to the plants.

Injury to vegetation from exposure to various levels or air contaminants can be termed acute, physiological, or chronic. Acute injury occurs as a result of a short-term exposure to a high contaminant concentration and is typically manifested by visible injury symptoms ranging from chlorosis (discoloration) to necrosis (dead areas). Physiological or latent injury occurs as the result of a long-term exposure to contaminant concentrations below that which results in acute injury symptoms. Chronic injury results from repeated exposure to low concentrations over extended periods of time, often without any visible symptoms, but with some effect on the overall growth and productivity of the plant. In this assessment, 100 percent of the particular air pollutant in the ambient air was assumed to interact with the vegetation. This is a conservative approach.

The concentrations of the pollutants, duration of exposure and frequency of exposures influence the response of vegetation and wildlife to atmospheric pollutants. The pattern of pollutant exposure expected from the facility is that of a few episodes of relatively high ground-level concentrations, which occur during certain meteorological conditions interspersed with long periods of extremely low ground-level concentrations. If there are any effects of stack emissions on plants and animals they will be from the short-term, higher doses. A dose is the product of the concentration of the pollutant and duration of the exposure.

Carbon Monoxide

Information pertaining to the effects of CO on plants is scarce. The main effect of high concentrations of CO is the inhibition of cytochrome c oxidase, the terminal oxidase in the mitochondrial electron transfer chain. Inhibition of cytochrome c oxidase depletes the supply of ATP, the principal donor of free energy required for cell functions. However, this inhibition only occurs at extremely high concentrations of CO. Pollok et al. (1989) reported that exposure to CO:O2 ratio of 25 (equivalent to an ambient CO concentration of 6.85×10^6 $\mu g/m^3$) resulted in stomatal closure in the leaves of the sunflower (Helianthus annuus). Naik et al. (1992) reported cytochrome c oxidase inhibition in corn, sorghum, millet, and Guinea grass at $CO:O_2$ ratios of 2.5 (equivalent to an ambient CO concentration of 6.85×10^5 $\mu g/m^3$). These plants were considered the species most sensitive to CO-induced inhibition of cytochrome c oxidase.

By comparison of published effect values for CO exposure, the possibility of plant damage in the Class I area can be determined. The maximum one hour (most conservative) estimated CO concentration due to the increase in emissions resulting from the proposed project in the Chassahowitzka NWA Class I area is 3.44 $\mu g/m^3$ (see Table 7-1). This concentration is less than 0.0005 percent of the value that caused inhibition in laboratory studies. The amount of damage sustained at this level (if any) for 1 hour would have negligible effects over an entire growing season. The predicted maximum annual CO concentration of 0.054 $\mu g/m^3$ reflects a more realistic (yet conservative) CO level for the Class I area. This concentration is less than 0.00001 percent of the value that caused cytochrome *c* oxidase inhibition.

VOC Emissions and Impacts on Ozone

It is difficult to predict what effect the proposed increase in emissions of VOC will have on ambient ozone (O_3) concentrations on a regional scale. VOC and NO_X emissions are precursors to the formation of O_3. O_3 is not directly emitted from fuel combustion, but is formed down-wind from emission sources when VOC and NO_X emissions react in the presence of sunlight. Natural (without man-made sources) ambient concentrations of O_3 are normally in the range of 20 to 39 $\mu g/m^3$ (0.01 to 0.02 ppm) (Heath, 1975).

O_3 can cause various damage to broad-leaved plants including: tissue collapse, interveinal necrosis and markings on the upper surface leaves know as stippling (pigmented yellow, light tan, red brown, dark brown, red, or purple), flecking (silver or bleached straw white), mottling, chlorosis or bronzing, and bleaching. O_3 can also stunt plant growth and bud formation. On certain plants such as citrus, grape, and tobacco, it is common for leaves to wither and drop early.

As described in Section 7.1, the VOC emissions due to the proposed project represent less than 1-percent increase in regional VOC emissions. Therefore, the effects of O_3, as a result of VOC emissions from the Project, are expected to have an insignificant effect on ozone levels.

7.3.4 Impacts to Wildlife

The major air quality risk to wildlife in the U.S. is from continuous exposure to pollutants above the NAAQS. This occurs in non-attainment areas, *e.g.*, Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source that experiences frequent upsets or episodic conditions resulting from malfunctioning equipment, unique meteorological conditions, or startup operations (Newman and Schreiber, 1988). Under these conditions, chronic effects (*e.g.*, particulate contamination) and acute effects (*e.g.*, injury to health) have been observed (Newman, 1981).

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary AAQS. Physiological and behavioral effects have been observed in experimental animals at or below these standards.

Because air quality at the PSD Class I area are less than the AAQS and is expected to remain below the AAQS when the Project becomes operational, the emissions are not expected to have a significant effect on wildlife.

APPLICATION FORMS

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 an 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: **Florida Power Corporation dba Progress Energy Florida, Inc.**	
2. Site Name: **Bartow Plant**	
3. Facility Identification Number: **1030011**	
4. Facility Location...: Street Address or Other Locator: **1601 Weedon Island Drive** City: **St. Petersburg** County: **Pinellas** Zip Code: **33702**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Ann Quillian, PE**
2. Application Contact Mailing Address... Organization/Firm: **Progress Energy Florida, Inc.** Street Address: **100 Central Avenue, MAC CX1B** City: **St. Petersburg** State: **FL** Zip Code: **33701**
3. Application Contact Telephone Numbers... Telephone: **(727) 820-5962** ext. Fax: **(727) 820-5229**
4. Application Contact Email Address: Ann.Quillian@pgnmail.com

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 7-31-06	3. PSD Number (if applicable): PSD-FL-381
2. Project Number(s): 1030011-010-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

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

Air Construction Permit

- ☒ 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

The application is submitted for the repowering of the Bartow Steam Units No. 1, No. 2, and No. 3 with four F-Class combined- and simple- cycle operable combustion turbines and one simple-cycle only combustion turbine. The application also includes an auxiliary boiler and 5 fuel gas heaters. See PSD Report.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
	Simple- and Combined Cycle F-Class Combustion Turbine with HRSG Duct Firing	AC1A	
	Simple- and Combined Cycle F-Class Combustion Turbine with HRSG Duct Firing	AC1A	
	Simple- and Combined Cycle F-Class Combustion Turbine with HRSG Duct Firing	AC1A	
	Simple- and Combined Cycle F-Class Combustion Turbine with HRSG Duct Firing	AC1A	
	Simple-Cycle F-Class Combustion Turbine	AC1A	
	Auxiliary Boiler	AC1A	
	Fuel Gas Heaters	AC1A	

Application Processing Fee

Check one: ☒ Attached - Amount: $ 7,500 ☐ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

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

1.	Owner/Authorized Representative Name : **Rufus Jackson**
2.	Owner/Authorized Representative Mailing Address... Organization/Firm: **Progress Energy Florida, Inc.** Street Address: **1601 Weedon Island Drive** City: **St. Petersburg** State: **FL** Zip Code: **33702**
3.	Owner/Authorized Representative Telephone Numbers... Telephone: **(727) 827-6111** ext. Fax: **(727) 827-6102**
4.	Owner/Authorized Representative Email Address: **Rufus.Jackson@pgnmail.com**
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.* Rufus S. Jackson 7/28/06 Signature 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

Professional Engineer Certification

1. Professional Engineer Name: **Scott Osbourn**
   Registration Number: **57557**

2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **5100 West Lemon St., Suite 114**
   City: **Tampa** State: **FL** Zip Code: **33609**

3. Professional Engineer Telephone Numbers...
   Telephone: **(813) 287-1717** ext. Fax: **(813) 287-1716**

4. Professional Engineer Email Address: **SOsbourn@Golder.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]
Signature

7/28/06
Date

(seal)

OSBOURN
LICENSE
NO. 57557
STATE OF
FLORIDA

* Attach any exception to certification statement.
**** Board of Professional Engineers Certificate of Authorization #00001670**

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 343.87 North (km) 3082.69		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 27/51/41 Longitude (DD/MM/SS) 82/36/6	
3. Governmental Facility Code: 0	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4911
7. Facility Comment : The project consists of one nominal 1,279 MW power block with four CT/HRSG trains and one simple-cycle CT at an additional 190 MW. See Scope of Application and the PSD report.			

Facility Contact

1. Facility Contact Name: Ann Quillian, PE
2. Facility Contact Mailing Address... Organization/Firm: Progress Energy Florida, Inc. Street Address: 100 Central Avenue, MAC CX1B City: St. Petersburg State: FL Zip Code: 33701
3. Facility Contact Telephone Numbers: Telephone: (727) 820-5962 ext. Fax: (727) 820-5229
4. Facility Contact Email Address: Ann.Quillian@pgnmail.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 INFORMATION

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: **CTs and HRSG Duct Burners are subject to NSPS 40 CFR 60, Subpart KKKK.** **CTs are subject to NESHAP 40 CFR 63, Subpart YYYY.**	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
CO – Carbon Monoxide	A	N
HAPS – Total Hazardous Air Pollutants	A	N
NOX – Nitrogen Oxides	A	N
PB – Lead – Total (elemental lead and lead compounds)	B	N
PM – Particulate Matter – Total	A	N
PM10 – Particulate Matter	A	N
SAM – Sulfuric Acid Mist	A	N
SO2 – Sulfur Dioxide	A	N
VOC – Volatile Organic Compounds	A	N

FACILITY INFORMATION

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) ☒ Attached, Document ID: PSD Report ☐ 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) ☒ Attached, Document ID: PSD Report ☐ 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) ☐ Attached, Document ID: ☒ Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

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

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:_____ ☐ 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: **Four identical Siemens F Class, SGT6-PAC-5000F CT/HRSGs with duct firing.**				
3. Emissions Unit Identification Number:				
4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **12/1/06**	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **49**	8. Acid Rain Unit? ☒ Yes ☐ No
9. Package Unit: Manufacturer: **Siemens** Model Number: **SGT6-PAC-5000F**				
10. Generator Nameplate Rating: **190** MW (each CT)				
11. Emissions Unit Comment: **Total nominal capacity of 1,279 MW consisting of 4 CTs, 4 duct fired HRSGs, and one steam turbine (4 x 4 x 1 configuration).**				

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Natural Gas
- **Combined cycle – SCR**

Distillate Fuel Oil
- **Water injection**
- **Combined cycle - SCR**

2. Control Device or Method Code(s): **25, 28, 65**

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

<u>Emissions Unit Operating Capacity and Schedule</u>

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **(see Appendix A of PSD Report)** million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **7** days/week **52** weeks/year **8760** hours/year	
6. Operating Capacity/Schedule Comment: **Appendix A of the PSD Report shows the maximum heat input at ISO conditions and base load for both natural gas and distillate oil firing. Appendix A of PSD Report also includes performance at various turbine inlet temperatures and loads.**	

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: **See PSD Report**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Exhausts through the HRSG stack during combined-cycle operation and through the bypass stack during simple-cycle operation. Stack height is equal for HRSG and bypass stacks (120 ft). The stack diameter is 22 ft for the bypass mode and 18 ft for the HRSG stacks.**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **120** feet	7. Exit Diameter: **18/22** feet
8. Exit Temperature: **See PSD Report** °F	9. Actual Volumetric Flow Rate: **See PSD Report** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: **See PSD Report** dscfm		12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **Tables 2-3 through 2-6 of the PSD Report show the emission point characteristics at ISO conditions and base load for each CT/HRSG. Appendix A of the PSD Report has emission point characteristics for various turbine inlet temperatures and operating loads.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 Gallons Used**	
4. Maximum Hourly Rate: **13.4**	5. Maximum Annual Rate: **13,373**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **130**
10. Segment Comment: **Million British Thermal Units (Btu) per SCC unit = 129.9 (rounded to 130). Based on 7.1 pounds per gallon (lb/gal); LHV = 18,514 Btu/lb ISO conditions; 1,000 hours per year (hr/yr) operation. See Section 2.0 in PSD Report for fuel usage of other loads and conditions.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.9**	5. Maximum Annual Rate: **16,693 (per CT)**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **933 LHV**
10. Segment Comment: **Based on 933 Btu/cf (LHV); ISO conditions and 8,760 hr/yr operation. See Section 2.0 in PSD Report for fuel usage of other loads and conditions**		

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
PM			NS
PM_{10}			NS
SO_2			NS
NO_X	025, 028	065	EL
CO			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9; if > 400 hrs oil firing.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0, Tables 2-5 and 2-6, and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas firing: See PSD Report, Section 2.0, Tables 2-3 and 2-4, and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9; if > 400 hrs oil firing.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil-firing: See PSD Report, Section 2.0, Tables 2-5 and 2-6, and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Gas-firing: See PSD Report, Section 2.0, Tables 2-3 and 2-4, and Appendix A.**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment: **Emission factor: 2 grains Sulfur (S) per 100 SCF gas; 0.05% S oil. See PSD Report, Section 2.0 and Appendix A.**	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.05% S oil**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Fuel sampling.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2 grains/100 SCF**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Fuel sampling.**	
6. Allowable Emissions Comment (Description of Operating Method): **Natural gas-firing CT with duct firing. See PSD Report Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **NO_X**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **42 ppmvd**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 20 and 7E; CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Requested allowable emissions at 15% O_2. Oil-firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **15 ppmvd**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 20 and 7E; CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Requested allowable emissions at 15% O_2. Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-5 and 2-6.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Method 10; base load; if > 400 hrs oil firing. CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-3 and 2-4.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Method 10; base load. CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	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: **See PSD Report, Section 2.0, Tables 2-3 through 2-6, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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.

<u>Allowable Emissions</u> Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-5 and 2-6.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 18, 25, or 25A; base load.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

<u>Allowable Emissions</u> Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-3 and 2-4.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 18, 25, or 25A; base load.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

<u>Allowable Emissions</u> 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 1 of 1

1. Visible Emissions Subtype: VE20	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 60 min/hour	
4. Method of Compliance: EPA Method 9	
5. Visible Emissions Comment: FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions per Rule 62-210.700, F.A.C.	

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 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_X**
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **not identified yet** Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **CEM required pursuant to 40 CFR Part 75. NO_X monitoring includes diluent monitor (O_2 or CO_2).**	

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **CO**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **not yet identified** Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **CEM monitor anticipated pursuant to previous BACT determinations.**	

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)
☒ Attached, Document ID: **PSD Report** ☐ 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)
☒ Attached, Document ID: **PSD Report** ☐ 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)
☒ Attached, Document ID: **PSD Report** ☐ 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)
☐ Attached, Document ID: _____ ☐ 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)
☐ Attached, Document ID: _____ ☐ 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: _____

☒ 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: _____ ☒ 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)) ☒ Attached, Document ID: **PSD Report** ☐ 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.) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
3.	Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements ☐ Attached, Document ID: _____ ☐ Not Applicable
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

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:

   One Siemens F Class, SGT6-PAC-5000F CT operating in simple-cycle mode.

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C	**12/1/06**		**49**	☒ Yes ☐ No

9. Package Unit:
   Manufacturer: **Siemens** Model Number: **SGT6-PAC-5000F**

10. Generator Nameplate Rating: **(See Section 2.0 and Appendix A of PSD Report)** MW

11. Emissions Unit Comment:

    Total nominal capacity of 190 MW consisting of 1 CT operating in simple-cycle mode.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: **Distillate Fuel Oil** • **Water injection**
2. Control Device or Method Code(s): **28**

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: **(see Appendix A)** million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	**7** days/week **8760** hours/year
6. Operating Capacity/Schedule Comment: **Appendix A of PSD Report shows the maximum heat input at ISO conditions and base load. Appendix A also has performance at various turbine inlet temperatures and loads.**	

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: **See PSD Report**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Exhausts through CT stack.**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **120** feet	7. Exit Diameter: **22** feet
8. Exit Temperature: **See PSD Report** °F	9. Actual Volumetric Flow Rate: **See PSD Report** acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: **See PSD Report** dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **Tables in Section 2.0 of the PSD Report show the emission point characteristics at ISO conditions and base load. Appendix A of the PSD Report has emission point characteristics for various turbine inlet temperatures and operating loads.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **Distillate (No. 2) Fuel Oil**		
2. Source Classification Code (SCC): **20100101**	3. SCC Units: **1,000 Gallons Used**	
4. Maximum Hourly Rate: **13.4**	5. Maximum Annual Rate: **13,373**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.05**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **130**
10. Segment Comment: **Million British Thermal Units (Btu) per SCC unit = 129.9 (rounded to 130). Based on 7.1 pounds per gallon (lb/gal); LHV = 18,514 Btu/lb ISO conditions; 1,000 hours per year (hr/yr) operation. See Section 2.0 in PSD Report for fuel usage of other loads and conditions.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **Natural Gas**		
2. Source Classification Code (SCC): **20100201**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **1.9**	5. Maximum Annual Rate: **16.693 (per CT)**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **933 LHV**
10. Segment Comment: **Based on 933 Btu/cf (LHV); ISO conditions and 8,760 hr/yr operation. See Section 2.0 in PSD Report for fuel usage of other loads and conditions.**		

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
PM			NS
PM_{10}			NS
SO_2			NS
NO_X	028		EL
CO			EL
VOC			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9; if > 400 hrs oil firing.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas firing: See PSD Report, Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Annual VE test: EPA Method 9; if > 400 hrs oil firing.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil-firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **10% opacity**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment: **Emission factor: 2 grains Sulfur (S) per 100 SCF gas; 0.05% S oil. See PSD Report, Section 2.0 and Appendix A.**	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.05% S oil**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **Fuel sampling.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2 grains/100 SCF**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Fuel sampling.**	
6. Allowable Emissions Comment (Description of Operating Method): **Natural gas-firing CT with duct firing. See PSD Report Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **NO_X**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0, and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **42 ppmvd @ 15% O2**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 20 and 7E; CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil-firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **15 ppmvd @ 15% O2**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 20 and 7E; CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	7. Emissions Method Code: **2**
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: **See PSD Report, Section 2.0 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Report**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Method 10; base load; if > 400 hrs oil firing. CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-2 and 2-3.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Method 10; base load. CEM – 24-hr block average.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **See PSD Report** lb/hour **See PSD Report** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **See PSD Report** Reference: **Siemens, 2006; PEF, 2006; Golder, 2006.**	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: **See PSD Report, Section 2.0 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-4.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 18, 25, or 25A; base load.**	
6. Allowable Emissions Comment (Description of Operating Method): **Oil firing: See PSD Report, Section 2.0 and Appendix A.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See PSD Table 2-2.**	4. Equivalent Allowable Emissions: **See PSD** lb/hour **See PSD** tons/year
5. Method of Compliance: **EPA Methods 18, 25, or 25A; base load.**	
6. Allowable Emissions Comment (Description of Operating Method): **Gas-firing: See PSD Report, Section 2.0 and Appendix A.**	

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 1 of 1

1. Visible Emissions Subtype: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **EPA Method 9**	
5. Visible Emissions Comment: **FDEP Rule 62-296.320(4)(b)1, F.A.C. requires 20 percent opacity. Excess emissions per Rule 62-210.700, F.A.C.**	

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 2

1. Parameter Code: **EM**	2. Pollutant(s): **NO_X**
3. CMS Requirement: ☒ Rule ☐ Other	
4. Monitor Information... Manufacturer: **not identified yet** Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **CEM required pursuant to 40 CFR Part 75. NO_X monitoring includes diluent monitor (O_2 or CO_2).**	

Continuous Monitoring System: Continuous Monitor 2 of 2

1. Parameter Code: **EM**	2. Pollutant(s): **CO**
3. CMS Requirement: ☐ Rule ☒ Other	
4. Monitor Information... Manufacturer: **not yet identified** Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **CEM monitor anticipated pursuant to previous BACT determinations.**	

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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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: _____

   ☒ 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: _____ ☒ 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)) ☒ Attached, Document ID: **PSD Report** ☐ 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.) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
3.	Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements ☐ Attached, Document ID: _____ ☐ Not Applicable
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

EMISSIONS UNIT INFORMATION
Section [2]
Simple-cycle CT

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:
   Natural gas fired steam boiler rated at 99 MMBtu/hr. The boiler provides steam for periods of combustion turbine startup or quick startup out of a short-term shutdown.

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C	**12/1/06**		**49**	☐ Yes ☒ No

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

   The emissions unit is regulated under NSPS – 40 CFR 60, Subpart Dc, Standards and Performance for Small Industrial-Commercial-Institutional Steam Generating Units, adopted and incorporated by reference in Rule 62-204.800(8), F.A.C.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: **None**
2. Control Device or Method Code(s):

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: **99** million Btu/hr			
4. Maximum Incineration Rate:	pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	**24** hours/day **52** weeks/year		**7** days/week **1,000** hours/year
6. Operating Capacity/Schedule Comment: **The boiler provides steam for periods of combustion turbine startup or quick startup out of a short-term shutdown.**			

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: **See PSD Report**	2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Auxiliary Boiler Stack**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **2.75** feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: **29,000** acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Natural Gas**		
2. Source Classification Code (SCC): **2-01-002-01**	3. SCC Units: **Million cubic feet**	
4. Maximum Hourly Rate: **0.096**	5. Maximum Annual Rate: **96.9**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1030 HHV**
10. Segment Comment: **Based on 99 MMBtu/hr; 1,000 hr/yr**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

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
PM			NS
SO_2			WP
NO_X			EL
CO			NS
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **NO_X**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **4.85** lb/hour **2.4** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.049 lb/MMBtu** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **See PSD Report, Section 2.0, Table 2-8 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.049 lb/MMBtu**	4. Equivalent Allowable Emissions: **4.85** lb/hour **2.4** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **SO_2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.55** lb/hour **0.28** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **2 grain S/100 scf-gas** Reference:	7. Emissions Method Code: **0**
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: **See PSD Report, Section 2.0, Table 2-8 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2 grain S/100 scf-gas**	4. Equivalent Allowable Emissions: **0.55** lb/hour **0.28** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **8.15** lb/hour **4.1** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.082 lb/MMBtu** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **See PSD Report, Section 2.0, Table 2-8 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.082 lb/MMBtu**	4. Equivalent Allowable Emissions: **8.15** lb/hour **4.1** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **0.53** lb/hour **0.27** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.005 lb/MMBtu** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **See PSD Report, Section 2.0, Table 2-8 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.005 lb/MMBtu**	4. Equivalent Allowable Emissions: **0.53** lb/hour **0.27** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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/PM_{10}**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.18** lb/hour **0.09** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.90 lb/10^6 cf gas – filterable PM** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **See PSD Report, Section 2.0, Table 2-8 and Appendix A.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.90 lb/10^6 cf gas – filterable PM**	4. Equivalent Allowable Emissions: **0.18** lb/hour **0.09** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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 1 of 1

1. Visible Emissions Subtype: **VE99**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment: **FDEP Rule 62-210.700(1), F.A.C.; allowed for 2-hours (120 minutes) per 24 hours for startup, shutdown, and malfunction.**	

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 _____ 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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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: _____

   ☒ 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: _____ ☒ 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)) ☒ Attached, Document ID: **PSD Report** ☐ 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.) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable
3.	Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements ☐ Attached, Document ID: ____ ☐ Not Applicable
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

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: **Five natural gas-fired gas heaters, each rated at 3 MMBtu/hr. The heaters are used heat the natural gas before the gas is fired in the combustion turbines.**

3. Emissions Unit Identification Number:

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **12/1/06**	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: **49**	8. Acid Rain Unit? ☐ Yes ☐ No

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: **None**	
2. Control Device or Method Code(s):	

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: 3million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: 24hours/day 52weeks/year	7days/week 8,760hours/year
6. Operating Capacity/Schedule Comment: The heaters are used heat the natural gas before the gas is fired in the combustion turbines.	

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: See PSD Report	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Each Gas Heaters has its own stack		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: V	6. Stack Height: 60 feet	7. Exit Diameter: 2 feet
8. Exit Temperature: 500°F	9. Actual Volumetric Flow Rate: 4,950 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Natural Gas**		
2. Source Classification Code (SCC): **2-01-002-01**	3. SCC Units: **Million Cubic Feet**	
4. Maximum Hourly Rate: **0.00289**	5. Maximum Annual Rate: **25.3**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1040 HHV**
10. Segment Comment: **Based on 3 MMBtu/hr; 8,760 hr/yr; per gas heater**		

Segment Description and Rate: Segment _____ of _____

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

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
PM			NS
SO2			WP
NOx			NS
CO			NS
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **0.29** lb/hour **1.3** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100 lb/MMscf of gas** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **Per gas heater. Seec PSD Report, Table 2-9.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **100 lb/MMscf of gas**	4. Equivalent Allowable Emissions: **0.29** lb/hour **1.3** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

<u>Potential/Estimated Fugitive Emissions</u>

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: **0.016** lb/hour **0.072** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **2 grain S/100 scf of gas** Reference:	7. Emissions Method Code: **0**
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: **Per gas heater. See PSD Report, Table 2-9.**	
11. Potential Fugitive and Actual Emissions Comment:	

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.

<u>Allowable Emissions</u> Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2 grain S / 100 scf of gas**	4. Equivalent Allowable Emissions: **0.016** lb/hour **0.072** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
6. Allowable Emissions Comment (Description of Operating Method):	

<u>Allowable Emissions</u> 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):	

<u>Allowable Emissions</u> 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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **0.24** lb/hour **1.1** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **84 lb/MMscf of gas** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **Per gas heater. See PSD Report, Table 2-9.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **84 lb/MMscf of gas**	4. Equivalent Allowable Emissions: **0.24** lb/hour **1.1** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **0.02** lb/hour **0.07** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **5.5 lb/MMscf of gas** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **Per gas heater. See PSD Report, Table 2-9.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **5.5 lb/MMscf of gas**	4. Equivalent Allowable Emissions: **0.02** lb/hour **0.07** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive 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: **0.005** lb/hour **0.024** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.90 lb/MMscf gas - filterable PM** Reference: **EPA AP-42**	7. Emissions Method Code: **3**
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: **Per gas heater. See PSD Report, Table 2-9.**	
11. Potential Fugitive and Actual Emissions Comment:	

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 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **1.90 lb/MMscf of gas - filterable PM**	4. Equivalent Allowable Emissions: **0.005** lb/hour **0.024** tons/year
5. Method of Compliance: **Natural Gas Combustion**	
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: **VE99**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **None**	
5. Visible Emissions Comment: **FDEP Rule 62-210.700(2); allowed for 2-hours (120 minutes) per 24 hours for startup, shutdown, and malfunction.**	

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:	

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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☒ Attached, Document ID: **PSD Report** ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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)
   ☐ Attached, Document ID: _____ ☐ 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: _____

   ☒ 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: _____ ☒ 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)) ☒ Attached, Document ID: **PSD Report** ☐ 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.) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable	
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: **PSD Report** ☐ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: _____ ☐ Not Applicable	
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

TABLES

Table 2-1. Summary of Maximum Potential Annual Emissions for the Bartow Repowering Project

Pollutant	Annual Emissions (tons/year): 4 - CTs Highest of Simple or Combined Cycle Operation	1 - CT Simple Cycle Operation[b]	Auxiliary Boiler	5 Natural Gas-Fired Heaters	TOTAL	Baseline Emission Rate (tons/yr)[a]	Net Emission Rate (tons/yr)	PSD Significant Emission Rate (tons/year)	PSD Review Required?
SO_2	375	89.7	0.3	0.4	466	24,816	-24,350	40	No
PM	348	64.9	0.09	0.12	413	804	-391	25	No
PM_{10}	348	64.9	0.09	0.12	413	559	-146	15	No
NO_x	2,591	591.3	2.4	6.3	3,191	4,043	-852	40	No
CO	774	154.5	4.1	5.3	938	367	571	100	Yes
VOC (as methane)	121	23.6	0.27	0.3	145	57	88	40	Yes
Sulfuric Acid Mist	58	13.7	Neg.	Neg.	72	423	-351	7	No
Lead	0.049	0.012	Neg.	Neg.	0.06	0.10	-0.04	0.6	No
HAPs	18.5	4.6	Neg.	Neg.	23.1	NE	23.1	NA	No

Note: Neg.= negligible; NA= not applicable; NE= not estimated

[a] Existing Emissions (TPY) Highest 2-year avg.

[b] One simple-cycle CT operating at 7,760 hours per year on natural gas and 1,000 hours per year on oil
Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table 2-2. Comparison of Representative Future Actual Emissions for Last Year of Construction and Past Actual Emissions

	Months	Particulate (PM)	Particulate (PM10)	Nitrogen Oxides	Sulfur Dioxides	Carbon Monoxide	Volatile Organic Compounds	SAM
Representative Actual Annual Emissions								
Units 1, 2 and 3	12	804	559	4,043	24,816	367	57	423
Repowered Plant	12	413	413	3,191	466	938	145	72
Representative Future Actual Emissions During Last Year of Construction								
Units 1, 2 and 3	6 [a]	402	280	2,022	12,408	184	29	212
Repowered Plant	6 [a]	207	207	1,596	233	469	73	36
Total:		609	486	3,617	12,641	653	101	248
Past Actual Emissions		804	559	4,043	24,816	367	57	423
Net Emissions Change [b]		-196	-73	-426	-12,175	286	44	-176
Max Hours (gas-firing) [c]		43,444	16,222	7,889	2,233,945	NA [d]	NA [d]	319,091
Max Hours (oil-firing) [c]		6,517	2,433	2,696	256,316	NA [d]	NA [d]	18,474

Notes:

a - Months based on maximum potential operation schedule for new and existing units from commercial operation date of 1st new unit.

b - Represents TPY available for each pollutant without triggering NSR

c - Max hours of operation of new CTs in interim mode without exceeding remaining baseline emissions.

d - NA because these pollutants have already triggered NSR

Table 2-3. Stack, Operating, and Emission Data for Combustion Turbines in Simple Cycle Operation- Natural Gas Combustion

		Operating and Emission Data [a] for Ambient Temperature			
		Combustion Turbine			
Parameter		**35 °F**	**59 °F**	**74 °F**	w/Evap Clr **95 °F**
CT Stack Data (ft)					
Height		120	120	120	120
Diameter		22	22	22	22
100 Percent Load					
Temperature (°F)		1063	1081	1099	1106
Velocity (ft/sec)		120	116	113	112
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	11.5	10.9	10.4	10.3
PM/PM_{10}	lb/hr	9.0	9.0	9.0	9.0
NO_x	lb/hr	118.3	111.7	106.7	105.0
CO	lb/hr	21.3	20.3	19.8	19.7
VOC (as methane)	lb/hr	2.8	2.6	2.5	2.5
Sulfuric Acid Mist	lb/hr	1.15	1.09	1.04	1.03
80 Percent Load		**20 °F**	**59 °F**	**74 °F**	**90 °F**
Temperature (°F)		1,006	1,032	1,108	1,083
Velocity (ft/sec)		96	92	98	91
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	9.1	8.5	8.7	7.9
PM/PM_{10}	lb/hr	9.0	9.0	9.0	9.0
NO_x	lb/hr	88.3	81.9	90.0	75.9
CO	lb/hr	16.5	15.6	16.7	14.8
VOC (as methane)	lb/hr	2.1	2.0	2.1	1.8
Sulfuric Acid Mist	lb/hr	0.91	0.85	0.87	0.79
60 Percent Load		**20 °F**	**59 °F**	**74 °F**	**90 °F**
Temperature (°F)		1,088	1,112	1,108	1,083
Velocity (ft/sec)		82	79	83	75
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	7.4	7.1	7.1	6.4
PM/PM_{10}	lb/hr	8.0	8.0	8.0	8.0
NO_x	lb/hr	72.0	68.1	73.3	63.0
CO	lb/hr	33.7	32.3	34.1	30.7
VOC (as methane)	lb/hr	7.1	6.7	6.8	6.1
Sulfuric Acid Mist	lb/hr	0.74	0.71	0.71	0.64

[a] Refer to Appendix A for detailed information on basis of pollutant emission rates and operating data. Duct firing is assumed for 100% operating load. No duct firing is assumed for loads less than 100%.

Table 2-4. Stack, Operating, and Emission Data for the Combustion Turbines/HRSGs and Duct Burners for Combined Cycle Operation- Natural Gas Combustion

		Operating and Emission Data [a] for Ambient Temperature															
		Combustion Turbine/ HRSG								Combustion Turbine/ HRSG/ Duct Burner							
Parameter		35 °F	35 °F w/PA	59 °F	w/EvpClr 59 °F w/PA	74 °F	w/EvpClr 74 °F w/PA	w/EvpClr 95 °F	w/EvpClr 95 °F w/PA	35 °F	35 °F w/PA	59 °F	w/EvpClr 59 °F w/PA	74 °F	w/EvpClr 74 °F w/PA	w/EvpClr 95 °F	w/EvpClr 95 °F w/PA
CT/HRSG Stack Data (ft)																	
Height		120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Diameter		18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
100 Percent Load																	
Temperature (°F)		190	190	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Velocity (ft/sec)		76.4	80.5	73.1	78.0	70.3	74.7	69.2	72.8	77.1	71.6	69.9	71.1	71.0	75.4	69.9	73.5
Maximum Hourly Emissions per Unit																	
SO_2	lb/hr	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9	14.3	15.0	13.6	14.6	13.2	14.0	13.0	13.7
PM/PM_{10}	lb/hr	11.3	11.5	11.2	11.4	11.1	11.3	11.1	11.2	14.4	14.5	14.3	14.4	14.2	14.3	14.1	14.3
NO_x	lb/hr	118.3	125.5	111.7	120.8	106.7	116.7	105.0	112.0	158.3	165.5	151.7	160.8	146.7	156.7	145.0	152.0
CO	lb/hr	21.3	24.1	20.3	23.4	19.8	22.6	19.7	22.1	41.3	44.1	40.3	43.4	39.8	42.6	39.7	42.1
VOC (as methane)	lb/hr	2.8	2.9	2.6	2.8	2.5	2.7	2.5	2.6	4.8	4.9	4.6	4.8	4.5	4.7	4.5	4.6
Sulfuric Acid Mist	lb/hr	1.15	1.23	1.09	1.18	1.04	1.13	1.03	1.09	1.70	1.78	1.64	1.73	1.60	1.68	1.58	1.65
80 Percent Load		20 °F		59 °F		74 °F	90 °F										
Temperature (°F)		190	NA	190	NA	190	190			NA	NA	NA	NA	NA	NA	NA	NA
Velocity (ft/sec)		63.5	NA	60.2	NA	60.5	57.1			NA	NA	NA	NA	NA	NA	NA	NA
Maximum Hourly Emissions per Unit																	
SO_2	lb/hr	9.1	NA	8.5	NA	8.7	7.9			NA	NA	NA	NA	NA	NA	NA	NA
PM/PM_{10}	lb/hr	10.8	NA	10.7	NA	10.8	10.6			NA	NA	NA	NA	NA	NA	NA	NA
NO_x	lb/hr	88.3	NA	81.9	NA	90.0	75.9			NA	NA	NA	NA	NA	NA	NA	NA
CO	lb/hr	16.5	NA	15.6	NA	16.7	14.8			NA	NA	NA	NA	NA	NA	NA	NA
VOC (as methane)	lb/hr	2.1	NA	2.0	NA	2.1	1.8			NA	NA	NA	NA	NA	NA	NA	NA
Sulfuric Acid Mist	lb/hr	0.91	NA	0.85	NA	0.87	0.79			NA	NA	NA	NA	NA	NA	NA	NA
60 Percent Load		20 °F		59 °F		74 °F	90 °F										
Temperature (°F)		190	NA	190	NA	190	190			NA	NA	NA	NA	NA	NA	NA	NA
Velocity (ft/sec)		51.3	NA	49.0	NA	51.5	47.1			NA	NA	NA	NA	NA	NA	NA	NA
Maximum Hourly Emissions per Unit																	
SO_2	lb/hr	7.4	NA	7.1	NA	7.1	6.4			NA	NA	NA	NA	NA	NA	NA	NA
PM/PM_{10}	lb/hr	9.5	NA	9.4	NA	9.4	9.3			NA	NA	NA	NA	NA	NA	NA	NA
NO_x	lb/hr	72.0	NA	68.1	NA	73.3	63.0			NA	NA	NA	NA	NA	NA	NA	NA
CO	lb/hr	33.7	NA	32.3	NA	34.1	30.7			NA	NA	NA	NA	NA	NA	NA	NA
VOC (as methane)	lb/hr	7.1	NA	6.7	NA	6.8	6.1			NA	NA	NA	NA	NA	NA	NA	NA
Sulfuric Acid Mist	lb/hr	0.74	NA	0.71	NA	0.71	0.64			NA	NA	NA	NA	NA	NA	NA	NA

[a] Refer to Appendix A for detailed information on basis of pollutant emission rates and operating data.
Duct firing is assumed for 100% operating load. No duct firing is assumed for loads less than 100%.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table 2-5. Stack, Operating, and Emission Data for Combustion Turbines in Simple Cycle Operation-Distillate Light Oil Combustion

Parameter		Operating and Emission Data [a] for Ambient Temperarure			
		Combustion Turbine			
		35 °F	**59 °F**	**74 °F**	w/Evap Clr **95 °F**
CT Stack Data (ft)					
Height		120	120	120	120
Diameter		22.0	22.0	22.0	22.0
100 Percent Load					
Temperature (°F)		1,030	1,044	1,065	1,072
Velocity (ft/sec)		117.4	113.4	110.6	109.3
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	100.4	95.0	91.0	89.6
PM/PM_{10}	lb/hr	60.0	60.0	60.0	60.0
NO_x	lb/hr	334.0	316.0	303.0	298.0
CO	lb/hr	158.3	151.3	147.7	146.8
VOC (as methane)	lb/hr	28.0	27.0	25.0	25.0
Lead	lb/hr	0.03	0.02	0.02	0.02
Sulfuric Acid Mist	lb/hr	20.1	19.0	18.2	17.9
80 Percent Load		**20 °F**	**59 °F**	**72 °F**	**105 °F**
Temperature (°F)		1,120	1,140	1,150	1,170
Velocity (ft/sec)		111.2	106.6	103.8	97.5
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	79.9	74.1	71.9	66.3
PM/PM_{10}	lb/hr	60.0	60.0	60.0	60.0
NO_x	lb/hr	270.3	251.9	243.2	224.0
CO	lb/hr	132.3	125.0	123.0	117.5
VOC (as methane)	lb/hr	22.4	20.9	20.1	18.6
Lead	lb/hr	0.02	0.02	0.02	0.02
Sulfuric Acid Mist	lb/hr	16.0	14.8	14.4	13.3
65 Percent Load		**20 °F**	**59 °F**	**72 °F**	**105 °F**
Temperature (°F)		1,170	228	228	228
Velocity (ft/sec)		105.1	62.8	61.6	58.1
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	67.4	63.0	61.6	57.5
PM/PM_{10}	lb/hr	60.0	60.0	60.0	60.0
NO_x	lb/hr	227.2	212.7	208.0	194.0
CO	lb/hr	110.9	105.5	105.4	102.7
VOC (as methane)	lb/hr	18.8	17.6	17.2	16.1
Lead	lb/hr	0.02	0.02	0.02	0.01
Sulfuric Acid Mist	lb/hr	13.5	12.6	12.3	11.5

[a] Refer to Appendix A for detailed information on basis of pollutant emission rates and operating data.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table 2-6. Stack, Operating, and Emission Data for the Combustion Turbines/HRSGs for Combined Cycle Operation-Distillate Light Oil Combustion

		Operating and Emission Data [a] for Ambient Temperarure			
		Combustion Turbine/ HRSG			
Parameter		35 °F	59 °F	74 °F	w/Evap Clr 95 °F
CT/HRSG Stack Data (ft)					
Height		120	120	120	120
Diameter		18.0	18.0	18.0	18.0
100 Percent Load					
Temperature (°F)		228	228	228	228
Velocity (ft/sec)		81.0	77.5	74.5	73.4
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	100.4	95.0	91.0	89.6
PM/PM_{10}	lb/hr	80.3	79.2	78.4	78.1
NO_x	lb/hr	334.0	316.0	303.0	298.0
CO	lb/hr	158.3	151.3	147.7	146.8
VOC (as methane)	lb/hr	28.0	27.0	25.0	25.0
Lead	lb/hr	0.03	0.02	0.02	0.02
Sulfuric Acid Mist	lb/hr	20.1	19.0	18.2	17.9
80 Percent Load		20 °F	59 °F	72 °F	105 °F
Temperature (°F)		228	228	228	228
Velocity (ft/sec)		72.3	68.5	66.3	61.5
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	79.9	74.1	71.9	66.3
PM/PM_{10}	lb/hr	76.2	75.0	74.5	73.4
NO_x	lb/hr	270.3	251.9	243.2	224.0
CO	lb/hr	132.3	125.0	123.0	117.5
VOC (as methane)	lb/hr	22.4	20.9	20.1	18.6
Lead	lb/hr	0.02	0.02	0.02	0.02
Sulfuric Acid Mist	lb/hr	16.0	14.8	14.4	13.3
65 Percent Load		20 °F	59 °F	72 °F	105 °F
Temperature (°F)		228	228	228	228
Velocity (ft/sec)		66.3	62.8	61.6	58.1
Maximum Hourly Emissions per Unit					
SO_2	lb/hr	67.4	63.0	61.6	57.5
PM/PM_{10}	lb/hr	73.6	72.7	72.4	71.6
NO_x	lb/hr	227.2	212.7	208.0	194.0
CO	lb/hr	110.9	105.5	105.4	102.7
VOC (as methane)	lb/hr	18.8	17.6	17.2	16.1
Lead	lb/hr	0.02	0.02	0.02	0.01
Sulfuric Acid Mist	lb/hr	13.5	12.6	12.3	11.5

[a] Refer to Appendix A for detailed information on basis of pollutant emission rates and operating data.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table 2-7. Proposed Emission Concentrations and Rates For Each CT in Various Operating Modes

Pollutant	Fuel	Method of Operation	Emisssion Rate			
			Maximum		59 °F	
			(ppmvd @15% O_2)	lb/hour	(ppmvd @15% O_2)	lb/hour
	Gas	Simple Cycle (SC)	15	122.1	15	108.0
Nitrogen Oxides	Gas	Combined Cycle (CC)	15	122.1	15	108.0
	Gas	CC - w/Duct Firing	17.8	165.5	16.3	151.7
	Gas	CC - w/Duct Firing, Power Aug.	14.1	152.0	NA	NA
	Oil	SC	42	334.0	42	316.0
	Oil	CC	42	334.0	42	316.0
Carbon Monoxide	Gas	Simple Cycle (SC), > 60% Load	4.0	24.1	4.0	20.3
	Gas	Combined Cycle (CC), > 60% Load	4.0	24.1	4.0	20.3
	Gas	SC and CC at 60% load	10.0	34.1	10.0	32.3
	Gas	CC - w/Duct Firing	9.4	39.8	8.0	40.3
	Gas	CC - w/Duct Firing, Power Aug.	7.8	42.6	NA	NA
	Oil	SC	30.0	158.3	30.0	151.3
	Oil	CC	30.0	158.3	30.0	151.3
Volatile Organic Compounds	Gas	Simple Cycle (SC)	1.00	2.83	1.00	2.50
	Gas	Combined Cycle (CC)	1.00	2.83	1.00	2.50
	Gas	CC - w/Duct Firing	2.17	4.80	1.79	4.60
	Gas	CC - w/Duct Firing, Power Aug.	1.76	4.70	NA	NA
	Oil	SC	10.0	28.0	10.0	27.0
	Oil	CC	10.0	28.0	10.0	27.0
Particulate Matter	Gas	Simple Cycle (SC)	NA	9.0	NA	9.0
	Gas	Combined Cycle (CC)	NA	11.5	NA	11.2
	Gas	CC - w/Duct Firing	NA	14.4	NA	14.3
	Gas	CC - w/Duct Firing, Power Aug.	NA	14.3	NA	NA
	Oil	SC	NA	60.0	NA	60.0
	Oil	CC	NA	80.3	NA	79.2
Sulfur Dioxide	Gas	Simple Cycle (SC)	NA	12.3	NA	10.9
	Gas	Combined Cycle (CC)	NA	12.3	NA	10.9
	Gas	CC - w/Duct Firing	NA	14.4	NA	13.6
	Gas	CC - w/Duct Firing, Power Aug.	NA	14.0	NA	NA
	Oil	SC	NA	100.4	NA	95.0
	Oil	CC	NA	100.4	NA	95.0
Sulfuic Acid Mist (SAM)	Gas	Simple Cycle (SC)	NA	1.23	NA	1.09
	Gas	Combined Cycle (CC)	NA	1.23	NA	1.09
	Gas	CC - w/Duct Firing	NA	1.70	NA	1.64
	Gas	CC - w/Duct Firing, Power Aug.	NA	1.68	NA	NA
	Oil	SC	NA	20	NA	19.0
	Oil	CC	NA	20	NA	19.0

Source: Siemens, 2006 - CT Performance Data; Golder, 2006

Note: Based on maximum emission rates over turbine inlet operating conditions for all operating loads.

Table 2-8. Performance, Stack Parameters and Emissions for Auxiliary Boiler

Performance	
Fuel Usage (scf/hr-gas)	96,945
Heat Input (mmBtu/hr-HHV)	99.00
Hours per Year	1,000
Maximum Fuel Usage (mmscf/yr)	96.94
Stack Parameters	
Diameter (ft)	2.75
Height (ft)	60
Temperature (^{o}F)	296
Velocity (ft/sec)	81
Flow (acfm)	29,000
Emissions	
SO_2 -Basis (grains S/100 scf-gas; %S diesel)	2.00
(lb/hr)	0.55
(tpy)	0.28
NO_x - (lb/mmBtu)	0.05
(lb/hr)	4.85
(tpy)	2.43
CO - (lb/mmBtu)	0.08
(lb/hr)	8.15
(tpy)	4.08
VOC - (lb/mmBtu)	0.01
(lb/hr)	0.53
(tpy)	0.27
PM/PM10 - (lb/10^6 ft^3)	1.90
(lb/hr)	0.18
(tpy)	0.09

Table 2-9. Performance, Stack Parameters, and Emissions for Natural Gas Fuel Heaters

	Natural Gas Heaters	
Performance[a]		
Heat Input (MMBtu/hr-HHV)	3.0	
Heat content (Btu/scf)	1040	
Hours per Year	8,760	
Number of Units	1	5
Fuel Usage (scf/hr-gas)	2,885	14,423
Maximum Fuel Usage (MMscf/yr)	25.27	126.35
Stack Parameters (typical)		
Height (ft)	60	60
Diameter (ft)	2	2
Temperature (°F)	500	500
Velocity (ft/sec)	26	26
Flow (acfm)	4,950	4,950
Emissions		
SO_2 -Basis (grains S/100 scf-gas)[b]	2	2
(lb/hr)	0.016	0.082
(TPY)	0.072	0.36
NO_x - (lb/MMscf)[c]	100	100
(lb/hr)	0.29	1.44
(TPY)	1.3	6.3
CO - (lb/MMscf)[c]	84	84
(lb/hr)	0.24	1.21
(TPY)	1.1	5.3
VOC - (lb/MMscf)[c]	5.5	5.5
(lb/hr)	0.02	0.08
(TPY)	0.07	0.35
PM/PM10 - (lb/MMscf)[d]	1.9	1.9
(lb/hr)	0.005	0.027
(TPY)	0.024	0.12

[a] Based on 10 MMBtu/hr (HHV) indirect gas heaters from Hanover Compression Company or equivalent.

[b] Typical maximum for natural gas.

[c] EPA, AP-42 Table 1.4-1 using small boilers < 100 MMBtu.hr and Table 1.4-2.

[d] EPA, AP-42 Table 1.4-2 Filterable PM.

TABLE 3-1
National and State AAQS, Allowable PSD Increments, and Significant Impact Levels

Pollutant	Averaging Time	AAQS ($\mu g/m^3$)[a] Primary Standard	AAQS ($\mu g/m^3$)[a] Secondary Standard	AAQS ($\mu g/m^3$)[a] Florida	PSD Increments ($\mu g/m^3$)[a] Class I	PSD Increments ($\mu g/m^3$)[a] Class II	PSD Class II Significant Impact Levels ($\mu g/m^3$)[b]
Particulate Matter[c] (PM_{10})	Annual Arithmetic Mean	50	50	50	4	17	1
	24-Hour Maximum	150	150	150	8	30	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum	365	NA	260	5	91	5
	3-Hour Maximum	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5	25	1
Ozone[c]	1-Hour Maximum	235	235	235	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5	NA	NA	NA

Note: Particulate matter (PM_{10}) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.
NA = Not applicable, i.e., no standard exists.

[a] Short-term maximum concentrations are not to be exceeded more than once per year except for the PM_{10} and ozone AAQS. The 24-hour PM_{10} AAQS is attained when the expected number of days per year with a 24-hour concentration above 150 μ/m^3 is equal to or less than 1. For modeling purposes, compliance is based on the sixth highest 24-hour concentration over a 5-year period. For ozone, the daily maximum 1-hour concentration cannot be exceeded an average of more than one per year.

[b] Maximum concentrations are not to be exceeded.

[c] On July 18, 1997, EPA promulgated revised AAQS for particulate matter and ozone. For particulate matter, $PM_{2.5}$ standards were introduced with a 24-hour standard of 65 g/m^3 (3-year average of 98th percentile) and an annual standard of 15 g/m^3 (3-year average at community monitors).
The ozone standard was modified to be 0.08 ppm; achieved when 3-year average of 99th percentile is 0.08 ppm 157 μ/m^3 or less. FDEP has not yet adopted these standards.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50; 40 CFR 52.21.
Chapter 62-204, F.A.C.

TABLE 3-2
PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration[a] ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter [PM(TSP)]	NSPS	25	10, 24-hour
Particulate Matter (PM_{10})	NAAQS	15	10, 24-hour
Nitrogen Dioxide	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[b]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below *de minimis* monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method established; therefore, no *de minimis* concentration has been established.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
g/m^3 = micrograms per cubic meter.

[a] Short-term concentrations are not to be exceeded.
[b] No *de minimis* concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.

Sources: 40 CFR 52.21; Rule 62-212.400.

TABLE 6-1

STRUCTURE DIMENSIONS USED IN THE MODELING ANALYSIS

BPIP Structure ID	Height (ft)	Height (m)	Length (ft)	Length (m)	Width (ft)	Width (m)
HRSG 1	80	24.4	25.9	7.9	92.5	28.2
HRSG 2	80	24.4	25.9	7.9	92.5	28.2
HRSG 3	80	24.4	25.9	7.9	92.5	28.2
HRSG 4	80	24.4	25.9	7.9	92.5	28.2
BOILER BLDG LOWER TIER	75	22.9	74.1	22.6	245.1	74.7
BOILER BLDG UPPER TIER	130	39.6	58.1	17.7	245.1	74.7
STEAM TURBINE	70	21.3	123.4	37.6	378.3	115.3
NORTH OF BOILER BLDG	154	46.9	81.0	24.7	103.0	31.4

TABLE 6-2
MAXIMUM POLLUTANT CONCENTRATIONS PREDICTED FOR PHASE I-
SIMPLE CYCLE OPERATION BY OPERATING LOAD AND AIR INLET TEMPERATURE,
FUEL OIL-FIRED COMBUSTION TURBINES AND NATURAL GAS-FIRED GAS HEATERS

				Maximum Predicted Concentration (ug/m^3) [a] for Phase I [b]					
		Averaging		100% Load		80% Load		65% Load	
Pollutant		Time	Rank	35 °F	95 °F	20 °F	105 °F	20 °F	105 °F
PSD Pollutants Requiring Review									
CO	2 CTs	8-Hour	Highest	15.8	15.7	13.6	14.2	12.1	12.9
		1-Hour	Highest	33.6	34.8	30.0	32.3	27.3	29.5
	2 Gas heaters	8-Hour	Highest	2.16	2.16	2.16	2.16	2.16	2.16
		1-Hour	Highest	4.96	4.96	4.96	4.96	4.96	4.96
	TOTAL	8-Hour	Highest	17.9	17.9	15.8	16.4	14.3	15.1
		1-Hour	Highest	38.6	39.7	35.0	37.3	32.3	34.5
PSD Pollutants Not Requiring Review									
SO_2	2 CTs	Annual	Highest	0.15	0.14	0.12	0.12	0.11	0.10
		24-Hour	Highest	4.59	4.45	3.83	3.71	3.43	3.35
		3-Hour	Highest	13.8	13.1	11.28	10.66	9.98	9.61
	2 Gas heaters	Annual	Highest	0.015	0.015	0.015	0.015	0.015	0.015
		24-Hour	Highest	0.087	0.087	0.087	0.087	0.087	0.087
		3-Hour	Highest	0.235	0.235	0.235	0.235	0.235	0.235
	TOTAL	Annual	Highest	0.16	0.16	0.14	0.13	0.12	0.12
		24-Hour	Highest	4.68	4.54	3.92	3.80	3.52	3.43
		3-Hour	Highest	14.0	13.4	11.5	10.9	10.2	9.8
PM_{10}	2 CTs	Annual	Highest	0.09	0.09	0.09	0.10	0.10	0.11
		24-Hour	Highest	2.74	2.98	2.87	3.35	3.06	3.49
	2 Gas heaters	Annual	Highest	0.005	0.005	0.005	0.005	0.005	0.005
		24-Hour	Highest	0.027	0.027	0.027	0.027	0.027	0.027
	TOTAL	Annual	Highest	0.09	0.10	0.10	0.11	0.10	0.11
		24-Hour	Highest	2.77	3.01	2.90	3.38	3.09	3.52
NO_2	2 CTs	Annual	Highest	0.49	0.47	0.41	0.39	0.36	0.35
	2 Gas heaters	Annual	Highest	0.14	0.14	0.14	0.14	0.14	0.14
	TOTAL	Annual	Highest	0.62	0.60	0.54	0.53	0.50	0.49

[a] Concentrations are based on highest concentrations predicted using five years of meteorological data from 2001 to 2005 of surface and upper air data from the National Weather Service station at Tampa International Airport.

[b] Includes two CTs operating in simple cycle mode with two gas heaters.

TABLE 6-3
MAXIMUM POLLUTANT CONCENTRATIONS PREDICTED FOR PHASE 2-
COMBINED AND SIMPLE CYCLE OPERATIONS BY OPERATING LOAD AND AIR INLET TEMPERATURE,
FUEL OIL-FIRED COMBUSTION TURBINES AND NATURAL GAS-FIRED GAS HEATERS

			Maximum Predicted Concentration (ug/m^3) [a] for Phase 2 [b]					
	Averaging		100% Load		80% Load		60% Load	
Pollutant	Time	Rank	35 °F	95 °F	20 °F	105 °F	20 °F	105 °F
PSD Pollutants Requiring Review								
CO	8-Hour	Highest	108	108	99.1	100	88.7	92.3
	1-Hour	Highest	153	151	137	138	123	128
PSD Pollutants Not Requiring Review								
SO_2	Annual	Highest	1.94	1.93	1.76	1.73	1.63	1.59
	24-Hour	Highest	33.1	33.2	30.2	29.5	27.8	26.7
		HSH	28.9	28.2	25.6	24.4	23.2	22.1
	3-Hour	Highest	84.2	81.3	73.4	68.7	65.9	61.7
		HSH	79.9	78.1	70.8	66.1	63.7	59.2
PM_{10}	Annual	Highest	0.60	0.60	0.60	0.80	0.70	0.90
	24-Hour	Highest	21.7	24.2	24.0	27.8	25.6	28.5
		HSH	18.0	20.4	20.3	22.6	21.2	24.4
NO_2	Annual	Highest	7.03	7.01	6.55	6.51	6.12	6.09

Note: HSH= highest, second highest

[a] Concentrations are based on highest concentrations predicted using five years of meteorological data from 2001 to 2005 of surface and upper air data from the National Weather Service station at Tampa International Airport.

[b] Includes four CTs operating in combined cycle mode and one CT operating in simple cycle mode with five gas heaters.
PM_{10} impacts include emission reductions from Boilers 1, 2 and 3

aux boiler

TABLE 6-4
SUMMARY OF MAXIMUM POLLUTANT CONCENTRATIONS PREDICTED FOR THE PROJECT PHASES 1 AND 2
COMPARED TO THE EPA CLASS II SIGNIFICANT IMPACT LEVELS

Pollutant	Averaging Time	Rank	Maximum Predicted Concentration (ug/m^3)	EPA Class II Significant Impact Levels (ug/m^3)	PSD Class II Increment (ug/m^3)
Phase 1- Simple Cycle					
PSD Pollutants Requiring Review					
CO	8-Hour	Highest	17.9	500	NA
	1-Hour	Highest	39.7	2,000	NA
PSD Pollutants Not Requiring Review					
SO_2	Annual	Highest	0.16	1	20
	24-Hour	Highest	4.68	5	91
	3-Hour	Highest	14.0	25	512
PM_{10}	Annual	Highest	0.11	1	17
	24-Hour	Highest	3.52	5	30
NO_2	Annual	Highest [b]	0.47	1	25
Phase 2- Combined and Simple Cycle					
PSD Pollutants Requiring Review					
CO	8-Hour	Highest	108	500	NA
	1-Hour	Highest	153	2,000	NA
PSD Pollutants Not Requiring Review					
SO_2	Annual	Highest	1.94	1	20
	24-Hour	Highest	33.2	5	NA
		HSH	28.9	NA	91
	3-Hour	Highest	84.2	25	NA
		HSH	79.9	NA	512
PM_{10}	Annual	Highest	0.90	1	17
	24-Hour	Highest	28.5	5	NA
		HSH	24.4	NA	30
NO_2	Annual	Highest [b]	5.27	1	25

Note: NA= not applicable
HSH= highest, second highest

[a] Phase 1 includes two CTs operating in simple cycle mode and firing fuel oil with two gas-fired gas heaters. Phase 2 includes four CTs operating in combined cycle mode and one CT operating in simple cycle mode, with five gas-fired gas heaters and an auxilliary boiler. All CTs are oil-fired.

[b] NO_2 concentration based on NO_x to NO_2 conversion rate of 75%.
PM_{10} impacts include emission reductions from Boilers 1, 2 and 3

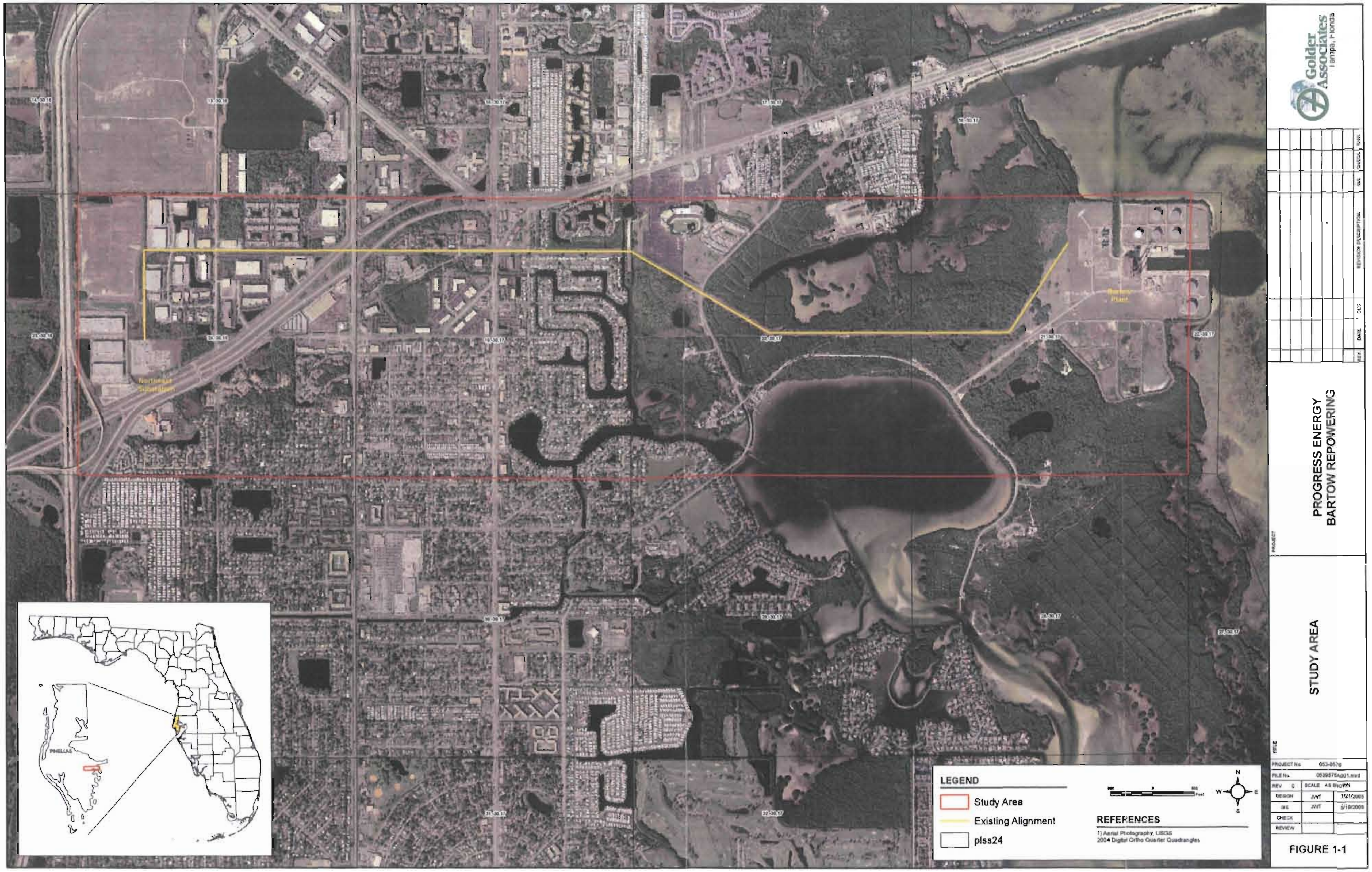
TABLE 7-1
MAXIMUM CO CONCENTRATIONS PREDICTED FOR THE PHASE 2 PROJECT, FUEL OIL-FIRED COMBUSTION TURBINES, NATURAL GAS-FIRED GAS HEATERS, AND AUXILLIARY BOILER AT THE PSD CLASS I AREA OF THE CHASSAHOWITZKA NWA

Pollutant	Averaging Time	Maximum Predicted Concentration (ug/m^3) [a] for Phase 2 [b] 2001	2002	2003
Phase 2- Combined and Simple Cycle				
CO	Annual	0.054	0.056	0.068
	24-Hour	0.73	0.72	1.03
	8-Hour	1.23	1.87	1.58
	3-Hour	2.09	2.19	2.17
	1-Hour	3.44	2.64	2.94

[a] Concentrations are based on highest concentrations predicted using the CALPUFF model and three years of meteorological data, 2001 to 2003, developd by VISTAS.

[b] Includes four CTs operating in combined cycle mode and one CT operating in simple cycle mode with five gas-fired gas heaters and an auxilliary boiler.

FIGURES


Golder Associates
Tampa, Florida
PROJECT
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BARTOW REPOWERING
TITLE
STUDY AREA
LEGEND
Study Area
Existing Alignment
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REFERENCES
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PROJECT No 053-8576
FILE No 0539576A001.mxd
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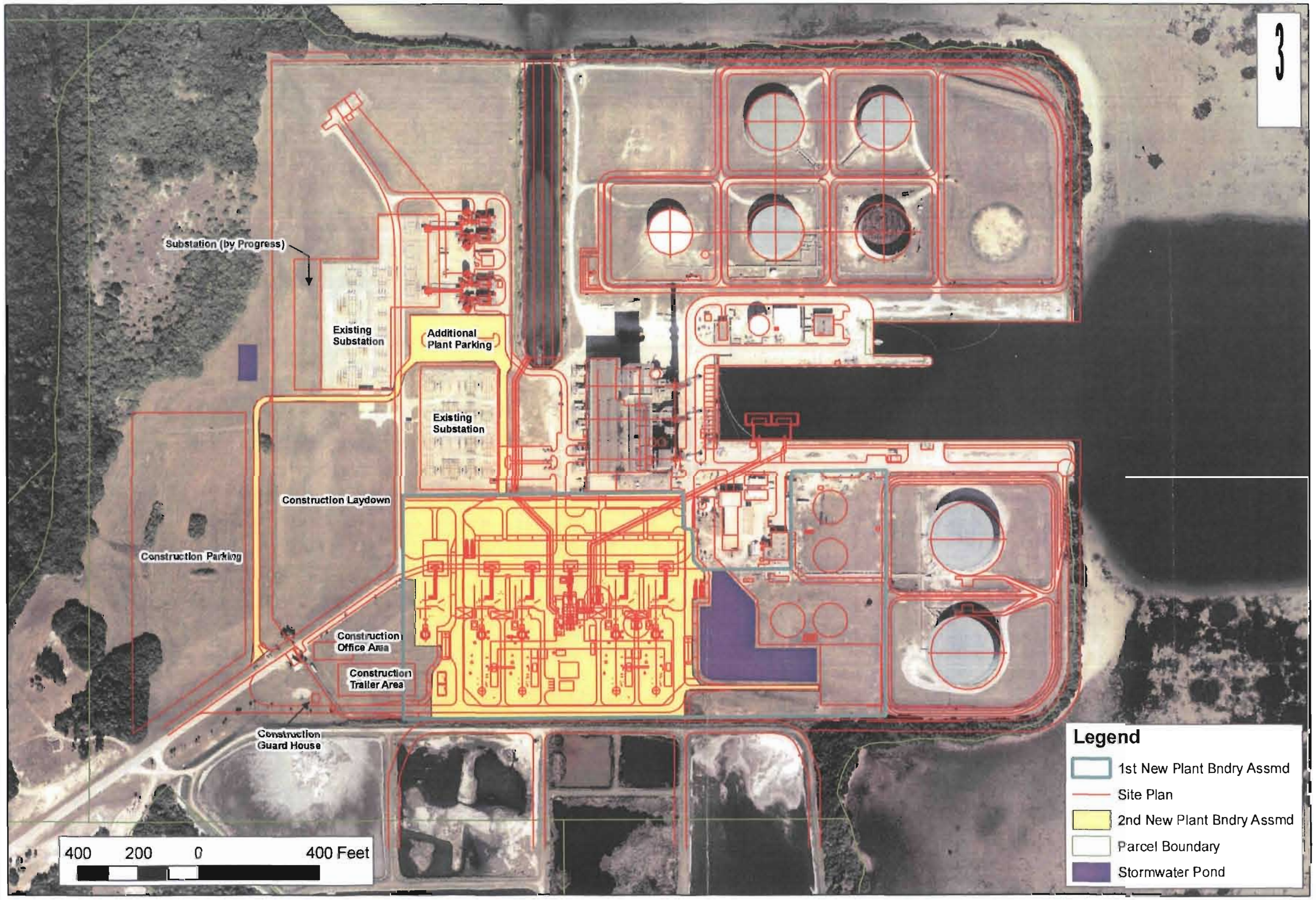
SCALE AS SHOWN
DESIGN JWT 7/21/2005
GIS JWT 5/19/2005
CHECK
REVIEW
PINELLAS
FIGURE 1-1



Golder Associates
Tampa, Florida

PROJECT
Bartow Repowering Project

TITLE
SITE LAYOUT

PROJECT No. 053-9576		
DATE	08 May 2006	
REV. 0	SCALE	
DESIGN	QY	08 May 2006
GIS	QY	08 May 2006
CHECK	MF	08 May 2006
REVIEW	MM	08 May 2006

FIGURE: 2-1

APPENDIX A

EXPECTED PERFORMANCE AND EMISSION INFORMATION ON "F" CLASS COMBUSTION TURBINES

Table A-1. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, Base Load (Note: CC Performance Data Used with SC Temperature for non-PA cases)

CT Only — Turbine Inlet Temperature

Parameter	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8
Combustion Turbine Performance								
Gross power output (MW)	207.12	228.92	192.47	217.95	181.07	203.87	176.70	195.54
Gross heat rate (Btu/kWh, LHV)	9,071	8,762	9,237	8,864	9,414	9,031	9,494	9,145
(Btu/kWh, HHV)	10,062	9,717	10,245	9,830	10,443	10,015	10,532	10,140
Heat Input (MMBtu/hr, LHV)	1,879	2,006	1,778	1,932	1,705	1,841	1,678	1,788
(MMBtu/hr, HHV)	2,084	2,225	1,972	2,143	1,891	2,042	1,861	1,983
Evaporative Cooler	Off	Off	Off	85%	Off	85%	85%	85%
Relative Humidity (%)	60	60	60	60	80	80	44.7	44.7
Fuel heating value (Btu/lb, LHV)	20,897	20,897	20,897	20,897	20,897	20,897	20,897	20,897
(Btu/lb, HHV)	23,175	23,175	23,175	23,175	23,175	23,175	23,175	23,175
(HHV/LHV)	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109
Steam Flow (lb/hr)	NA	NA	NA	NA	NA	123,337	NA	119,785
Duct Burner (DB)								
Heat input (MMBtu/hr, HHV)	0	0	0	0	0	0	0	0
(MMBtu/hr, LHV)	0	0	0	0	0	0	0	0
CT/DB Exhaust Flow								
Mass Flow (lb/hr)- with margin if applic	4,201,488	4,342,431	4,009,011	4,194,884	3,838,934	4,003,299	3,768,327	3,892,326
- provided	4,201,488	4,342,431	4,009,011	4,194,884	3,838,934	4,003,299	3,768,327	3,892,326
Temperature (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
Moisture (% Vol.)	7.71	12.62	8.22	13.31	9.4	14.31	10.14	14.85
Oxygen (% Vol.)	12.67	11.55	12.64	11.45	12.41	11.28	12.26	11.19
Molecular Weight	28.46	27.93	28.41	27.85	28.27	27.74	28.20	27.68
Fuel Usage								
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))								
Heat input (MMBtu/hr, LHV)	1,879	2,006	1,778	1,932	1,705	1,841	1,678	1,788
Heat content (Btu/lb, LHV)	20,897	20,897	20,897	20,897	20,897	20,897	20,897	20,897
Fuel usage (lb/hr)- calculated	89,917	95,995	85,084	92,453	81,591	88,099	80,299	85,563
Heat content (Btu/cf, LHV)- assumed	933	933	933	933	933	933	933	933
Fuel density (lb/ft^3)	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447
Fuel usage (cf/hr)- calculated	2,013,053	2,149,114	1,904,848	2,069,834	1,826,640	1,972,342	1,797,713	1,915,561
Fuel Usage - Duct Burner Only								
Fuel usage (lb/hr)- calculated	0	0	0	0	0	0	0	0
Fuel usage (cf/hr)- calculated	0	0	0	0	0	0	0	0
HRSG Stack								
CT/Bypass-Stack height (ft)	120	120	120	120	120	120	120	120
Diameter (ft)	22	22	22	22	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120	120	120	120	120
Diameter (ft)	18	18	18	18	18	18	18	18
CT Flow Conditions								
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr								
Mass flow (lb/hr)	4,201,488	4,342,431	4,009,011	4,194,884	3,838,934	4,003,299	3,768,327	3,892,326
Temperature (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
Molecular weight	28.46	27.93	28.41	27.85	28.27	27.74	28.20	27.68
Volume flow (acfm)- calculated	2,734,702	2,901,522	2,645,556	2,832,464	2,575,346	2,743,774	2,546,027	2,690,367
(ft3/s)- calculated	45,578	48,359	44,093	47,208	42,922	45,730	42,434	44,839
Diameter (ft)	22	22	22	22	22	22	22	22
Velocity (ft/sec)- calculated	119.9	127.2	116.0	124.2	112.9	120.3	111.6	118.0

CT with Duct Burner — Turbine Inlet Temperature

Parameter	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8
Combustion Turbine Performance								
Gross power output (MW)	207.12	228.92	192.47	217.95	181.07	203.87	176.70	195.54
Gross heat rate (Btu/kWh, LHV)	9,071	8,762	9,237	8,864	9,414	9,031	9,494	9,145
(Btu/kWh, HHV)	10,061	9,718	10,245	9,831	10,443	10,015	10,532	10,140
Heat Input (MMBtu/hr, LHV)	1,879	2,006	1,778	1,932	1,705	1,841	1,678	1,788
(MMBtu/hr, HHV)	2,084	2,225	1,972	2,143	1,891	2,042	1,861	1,983
Evaporative Cooler	Off	Off	Off	Off	Off	Off	Off	Off
Relative Humidity (%)	20	20	20	20	20	20	20	20
Fuel heating value (Btu/lb, LHV)	20,897	20,897	20,897	20,897	20,897	20,897	20,897	20,897
(Btu/lb, HHV)	23,175	23,175	23,175	23,175	23,175	23,175	23,175	23,175
(HHV/LHV)	1.109	1.109	1.109	1.109	1.109	1.109	1.109	1.109
Steam Flow (lb/hr)	NA	NA	NA	NA	NA	NA	NA	NA
Duct Burner (DB)								
Heat input (MMBtu/hr, HHV)	500	500	500	500	500	500	500	500
(MMBtu/hr, LHV)	450.9	450.9	450.9	450.9	450.9	450.9	450.9	450.9
CT/DB Exhaust Flow								
Mass Flow (lb/hr)- with margin if applic	4,221,597	4,362,540	4,029,120	4,214,993	3,859,043	4,023,408	3,788,436	3,912,435
- provided								
Temperature (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
Moisture (% Vol.)	9.34	16.00	10.47	16.44	11.15	15.92	11.91	16.49
Oxygen (% Vol.)	10.87	11.15	11.35	10.72	10.45	9.45	10.27	9.31
Molecular Weight	28.36	31.53	29.86	30.70	28.16	27.64	28.08	27.58
Fuel Usage								
Heat input (MMBtu/hr, LHV)	1,879	2,006	1,778	1,932	1,705	1,841	1,678	1,788
Heat content (Btu/lb, LHV)	20,897	20,897	20,897	20,897	20,897	20,897	20,897	20,897
Fuel usage (lb/hr)- calculated	89,917	95,995	85,084	92,453	81,591	88,099	80,299	85,563
Heat content (Btu/cf, LHV)- assumed	933	933	933	933	933	933	933	933
Fuel density (lb/ft^3)	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447	0.0447
Fuel usage (cf/hr)- calculated	2,013,053	2,149,114	1,904,848	2,069,834	1,826,640	1,972,342	1,797,713	1,915,561
Fuel Usage - Duct Burner Only								
Fuel usage (lb/hr)- calculated	21,575	21,575	21,575	21,575	21,575	21,575	21,575	21,575
Fuel usage (cf/hr)- calculated	483,022	483,022	483,022	483,022	483,022	483,022	483,022	483,022
HRSG Stack								
CT/Bypass-Stack height (ft)	120	120	120	120	120	120	120	120
Diameter (ft)	22	22	22	22	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120	120	120	120	120
Diameter (ft)	18	18	18	18	18	18	18	18
CT Flow Conditions								
Mass flow (lb/hr)	NA	NA	NA	NA	NA	NA	NA	NA
Temperature (°F)	NA	NA	NA	NA	NA	NA	NA	NA
Molecular weight	NA	NA	NA	NA	NA	NA	NA	NA
Volume flow (acfm)- calculated	NA	NA	NA	NA	NA	NA	NA	NA
(ft3/s)- calculated	NA	NA	NA	NA	NA	NA	NA	NA
Diameter (ft)	NA	NA	NA	NA	NA	NA	NA	NA
Velocity (ft/sec)- calculated	NA	NA	NA	NA	NA	NA	NA	NA

Table A-1. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, Base Load (Note: CC Performance Data Used with SC Temperature for non-PA cases)

Parameter	CT Only Turbine Inlet Temperature							
	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8
HRSG Stack Flow Conditions								
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min								
Mass flow (lb/hr)	4,201,488	4,342,431	4,009,011	4,194,884	3,838,934	4,003,299	3,768,327	3,892,326
HRSG Stack Temperature (°F)	190	190	190	190	190	190	190	190
Molecular weight	28.46	27.93	28.41	27.85	28.27	27.74	28.20	27.68
Volume flow (acfm)	1,167,141	1,229,458	1,115,906	1,190,881	1,073,749	1,141,045	1,056,780	1,111,722
Diameter (ft)	18	18	18	18	18	18	18	18
Velocity (ft/sec)- calculated	76.4	80.5	73.1	78.0	70.3	74.7	69.2	72.8

Parameter	CT with Duct Burner Turbine Inlet Temperature							
	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8
HRSG Stack Flow Conditions								
Mass flow (lb/hr)	4,221,597	4,362,540	4,029,120	4,214,993	3,859,043	4,023,408	3,788,436	3,912,435
HRSG Stack Temperature (°F)	190	190	190	190	190	190	190	190
Molecular weight	28.36	31.53	29.86	30.70	28.16	27.64	28.08	27.58
Volume flow (acfm)	1,177,066	1,093,932	1,066,810	1,085,441	1,083,566	1,150,969	1,066,810	1,121,757
Diameter (ft)	18	18	18	18	18	18	18	18
Velocity (ft/sec)- calculated	77.1	71.6	69.9	71.1	71.0	75.4	69.9	73.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft^3.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006 - DB Calculations.

Table A-2. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NOx Combustor, Natural Gas, Base Load (Note: CC Performance Data Used with SC Temperature for non-PA cases)

	CT Only								CT with Duct Burner							
	Turbine Inlet Temperature								Turbine Inlet Temperature							
Parameter	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8	35 °F Case 15	35 °F w/PA Case 4	59 °F Case 19	59 °F w/PA Case 6	74 °F Case 3	74 °F w/PA Case 1	95 °F Case 28	95 °F w/PA Case 8
Particulate from CT, DB, and SCR																
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only																
a. PM_{10} (front half) (lb/hr)																
CT- provided	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
DB (lb/hr) - calculated	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Total CT/DB emission rate (lb/hr)	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})																
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3																
SO_2 emission rate (lb/hr)- calculated	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9	14.3	15.0	13.6	14.6	13.2	14.0	13.0	13.7
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
MW $(NH_4)_2$ SO_4/ SO_3 (132/80)	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	2.33	2.48	2.20	2.39	2.11	2.28	2.08	2.21	2.88	3.04	2.76	2.95	2.67	2.84	2.63	2.77
Total CT emission rate (lb/hr) [a]	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	NA	NA	NA	NA	NA	NA	NA	NA
Total HRSG stack emission rate (lb/hr) [a + b]	11.3	11.5	11.2	11.4	11.1	11.3	11.1	11.2	14.4	14.5	14.3	14.4	14.2	14.3	14.1	14.3
(lb/mmBtu, HHV)	0.0054	0.0052	0.0057	0.0053	0.0059	0.0055	0.0060	0.0057	0.0056	0.0053	0.0058	0.0055	0.0059	0.0056	0.0060	0.0057
Sulfur Dioxide																
SO_2 (lb/hr)= Natural gas (scf/hr) x sulfur content(gr/100 scf) x 1 lb/7000 gr x (lb SO_2 /lb S) /100																
Fuel use (cf/hr)	2,013,053	2,149,114	1,904,848	2,069,834	1,826,640	1,972,342	1,797,713	1,915,561	2,496,075	2,632,136	2,387,870	2,552,856	2,309,662	2,455,364	2,280,735	2,398,583
Sulfur content (grains/ 100 cf)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
lb SO_2 /lb S (64/32)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CT emission rate (lb/hr)	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9	NA	NA	NA	NA	NA	NA	NA	NA
HRSG Stack emission rate (lb/hr)	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9	14.3	15.0	13.6	14.6	13.2	14.0	13.0	13.7
Nitrogen Oxides																
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x [[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)) x 2116.8 lb/ft^2 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]																
CT/DB, ppmvd @15% O_2	15	15	15	15	15	15	15	15	15.3	17.8	16.3	16.8	15.0	14.3	14.9	14.1
Moisture (%)	7.71	12.62	8.22	13.31	9.4	14.31	10.14	14.85	9.34	16.00	10.47	16.44	11.15	15.92	11.91	16.49
Oxygen (%)	12.67	11.55	12.64	11.45	12.41	11.28	12.26	11.19	10.87	11.15	11.35	10.72	10.45	9.45	10.27	9.31
Turbine Flow (acfm)	2,734,702	2,901,522	2,645,556	2,832,464	2,575,346	2,743,774	2,546,027	2,690,367	2,757,955	2,924,653	2,724,780	2,856,068	2,598,891	2,767,638	2,581,679	2,714,652
Turbine Exhaust Temperatore (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
CT/DB Emission rate (lb/hr)	114.3	122.1	108.0	117.5	103.6	111.9	101.9	108.6	158.3	165.5	151.7	160.8	146.7	156.7	145.0	152.0
CT/DB Emission rate (lb/hr) - provided	118.3	125.5	111.7	120.8	106.7	116.7	105.0	112.0								
Vendor lb/hr data provided at 9 ppmvd @15% O_2, values scaled up by factor of 15/9 to adjust to 15 ppmvd @15% O_2.																
Carbon Monoxide																
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]																
Basis, ppmvd - Calculated	5.58	6.34	5.60	6.41	5.76	6.52	5.86	6.58	11.1	12.1	11.2	12.4	11.8	12.6	12.0	12.8
Basis, ppmvd @ 15% O2 - given	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	7.3	9.4	8.0	9.0	7.6	7.7	7.7	7.8
Moisture (%)	7.71	12.62	8.22	13.31	9.40	14.31	10.14	14.85	9.34	16.00	10.47	16.44	11.15	15.92	11.91	16.49
Oxygen (%)	12.67	11.55	12.64	11.45	12.41	11.28	12.26	11.19	10.87	11.15	11.35	10.72	10.45	9.45	10.27	9.31
Turbine Flow (acfm)	2,734,702	2,901,522	2,645,356	2,832,464	2,575,346	2,743,774	2,546,027	2,690,367	2,757,955	2,924,653	2,724,780	2,856,068	2,598,891	2,767,638	2,581,679	2,714,652
Turbine Exhaust Temperature (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
CT/DB Emission rate (lb/hr)	21.3	24.1	20.3	23.4	19.83	22.6	19.7	22.1	41.3	44.1	40.3	43.4	39.8	42.6	39.7	42.1
HRSG Stack emission rate (lb/hr)	21.3	24.1	20.3	23.4	19.8	22.6	19.7	22.1	41.3	44.1	40.3	43.4	39.8	42.6	39.7	42.1
CT/DB Emission rate (lb/hr) - Provided	20.0	20.4	19.0	19.6	18.0	19.0	17.0	18.2								
Volatile Organic Compounds																
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]																
Basis, ppmvw	1.12	1.14	1.11	1.13	1.11	1.12	1.11	1.12	2.3	2.4	2.2	2.4	2.3	2.4	2.4	2.5
Basis, ppmvd @ 15% O2 - given	1	1	1	1	1	1	1	1	1.6	2.2	1.8	2.1	1.7	1.8	1.7	1.8
Moisture (%)	7.71	12.62	8.22	13.31	9.40	14.31	10.14	14.85	9.34	16.00	10.47	16.44	11.15	15.92	11.91	16.49
Oxygen (%) wet	12.67	11.55	12.64	11.45	12.41	11.28	12.26	11.19	10.87	11.15	11.35	10.72	10.45	9.45	10.27	9.31
Turbine Flow (acfm)	2,734,702	2,901,522	2,645,556	2,832,464	2,575,346	2,743,774	2,546,027	2,690,367	2,757,955	2,924,653	2,724,780	2,856,068	2,598,891	2,767,638	2,581,679	2,714,652
Turbine Exhaust Temperature (°F)	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113	1,063	1,074	1,081	1,086	1,099	1,103	1,106	1,113
CT/DB Emission rate (lb/hr)	2.65	2.83	2.50	2.72	2.40	2.59	2.36	2.52	4.80	4.90	4.60	4.80	4.50	4.70	4.50	4.60
HRSG Stack Emission rate (lb/hr)	2.65	2.83	2.50	2.72	2.40	2.59	2.36	2.52	4.80	4.90	4.60	4.80	4.50	4.70	4.50	4.60
HRSG Stack Emission rate (lb/hr) - provided	2.80	2.90	2.60	2.80	2.50	2.70	2.50	2.60								
Sulfuric Acid Mist																
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100																
CT SO_2 emission rate (lb/hr) - provided	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9	11.5	12.3	10.9	11.8	10.4	11.3	10.3	10.9
CT Conversion to H_2SO_4 (% by weight) - provided	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0	0	0	0	0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
OB Conversion to H_2SO_4 (%) - provided	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
CT/Bypass Stack Emission rate (lb/hr)	1.15	1.23	1.09	1.18	1.04	1.13	1.03	1.09	NA	NA	NA	NA	NA	NA	NA	NA
HRSG Stack Emission rate (lb/hr)	1.15	1.23	1.09	1.18	1.04	1.13	1.03	1.09	1.70	1.78	1.64	1.73	1.60	1.68	1.58	1.65
Lead																
Lead (lb/hr) = NA																
Emission Rate Basis	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HRSG Stack Emission rate (lb/hr)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006 - DB Calculations.

Table A-3. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F,, Dry Low NO_X Combustor, Natural Gas, 80 % Load (Note: CC Performance Data Used)

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	6	NA
Combustion Turbine Performance				
Gross power output (MW)	160.8	145.19	144.633	127.4
Gross heat rate (Btu/kWh, LHV)	9,255	9,516	9,867	10,065
(Btu/kWh, HHV)	10,265	10,558	10,952	11,162
Heat Input (MMBtu/hr, LHV)	1,488	1,382	1,428	1,282
(MMBtu/hr, HHV)	1,651	1,533	1,584	1,422
Relative Humidity (%)	60	60	80	50
Fuel heating value (Btu/lb, LHV)	20,897	20,897	20,897	20,897
(Btu/lb, HHV)	23,180	23,180	23,180	23,180
(HHV/LHV)	1.109	1.109	1.109	1.109
CT Exhaust Flow				
Mass Flow (lb/hr)- with no margin	3,497,411	3,302,475	3,302,906	3,118,517
- provided	3,497,411	3,302,475	3,302,906	3,118,517
Temperature (°F)	1,006	1,032	1,108	1,083
Moisture (% Vol.)	7.1	7.75	9.22	9.14
Oxygen (% Vol.)	13.27	13.25	12.62	13.12
Molecular Weight	28.50	28.43	28.28	28.27
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,488	1,382	1,428	1,282
Heat content (Btu/lb, LHV)	20,897	20,897	20,897	20,897
Fuel usage (lb/hr)- calculated	71,206	66,134	68,335	61,349
Heat content (Btu/cf, LHV)- assumed	933	933	933	933
Fuel density (lb/ft^3)	0.0447	0.0447	0.0447	0.0447
Fuel usage (cf/hr)- calculated	1,594,732	1,481,128	1,530,428	1,373,956
HRSG Stack				
CT/Bypass-Stack height (ft)	120	120	120	120
Diameter (ft)	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120
Diameter (ft)	18	18	18	18
CT Flow Conditions				
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,497,411	3,302,475	3,302,906	3,118,517
Temperature (°F)	1,006	1,032	1,108	1,083
Molecular weight	28.50	28.43	28.28	28.27
Volume flow (acfm)- calculated	2,188,271	2,108,229	2,227,379	2,070,770
(ft^3/s)- calculated	36,471	35,137	37,123	34,513
Diameter (ft)	22.0	22.0	22.0	22.0
Velocity (ft/sec)- calculated	95.9	92.4	97.7	90.8

Table A-3. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F,, Dry Low NO_X Combustor, Natural Gas, 80 % Load (Note: CC Performance Data Used)

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	6	NA
HRSG Stack Flow Conditions				
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min				
Mass flow (lb/hr)	3,497,411	3,302,475	3,302,906	3,118,517
HRSG Stack Temperature (°F)	190	190	190	190
Molecular weight	28.50	28.43	28.28	28.27
CT volume flow (acfm)	970,243	918,464	923,340	872,327
Diameter (ft)	18	18	18	18
Velocity (ft/sec)- calculated	63.5	60.2	60.5	57.1

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft³

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-4. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, 80% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	6	NA
Particulate from CTand SCR				
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only				
a. PM_{10} (front half) (lb/hr)				
CT- provided	9.0	9.0	9.0	9.0
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})				
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3				
SO_2 emission rate (lb/hr)- calculated	9.1	8.5	8.7	7.9
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100
MW $(NH_4)_2$ SO_4/ SO_3 (132/80)	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	1.84	1.71	1.77	1.59
Total CT emission rate (lb/hr) [a]	9.0	9.0	9.0	9.0
Total HRSG stack emission rate (lb/hr) [a + b]	10.8	10.7	10.8	10.6
(lb/mmBtu, HHV)	0.0063	0.0066	0.0065	0.0070
Sulfur Dioxide				
SO_2 (lb/hr)= Natural gas (scf/hr) x sulfur content(gr/100 scf) x 1 lb/7000 gr x (lb SO_2 /lb S) /100				
Fuel use (cf/hr)	1,594,732	1,481,128	1,530,428	1,373,956
Sulfur content (grains/ 100 cf)	2	2	2	2
lb SO_2 /lb S (64/32)	2	2	2	2
CT/Bypasss Stack, ppmvd @ 15% O_2	9.1	8.5	8.7	7.9
HRSG Stack emission rate (lb/hr)- calculated	9.1	8.5	8.7	7.9
Nitrogen Oxides				
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft^2 x Volume flow (acfm) 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT / DB, ppmvd @15% O_2	15	15	15	15
Moisture (%)	7.1	7.75	9.22	9.14
Oxygen (%)	13.27	13.25	12.62	13.12
Turbine Flow (acfm)	2,188,271	2,108,229	2,227,379	2,070,770
Turbine Exhaust Temperature (°F)	1,006	1,032	1,108	1,083
CT/DB Emission rate (lb/hr)	88.2	81.9	86.8	75.7
CT/Bypasss Stack, ppmvd @ 15% O_2	15	15	15	15
CT/Bypass Stack Emission rate (lb/hr)	88.20	81.92	86.76	75.73
CT/Bypass Stack Emission rate (lb/hr) - provided	88.29	81.86	90.00	75.86

Table A-4. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, 80% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	6	NA
Carbon Monoxide				
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd	5.17	5.19	5.61	5.27
Basis, ppmvd @ 15% O2 - given	4	4	4	4
Moisture (%)	7.1	7.75	9.22	9.14
Oxygen (%)	13.27	13.25	12.62	13.12
Turbine Flow (acfm)	2,188,271	2,108,229	2,227,379	2,070,770
Turbine Exhaust Temperature (°F)	1,006	1,032	1,108	1,083
HRSG Exhaust Temperature (°F)	190	190	190	190
CT/Bypass Stack Emission rate (lb/hr)	16.5	15.6	16.7	14.8
HRSG Stack emission rate (lb/hr)	16.5	15.6	16.7	14.8
HRSG Stack emission rate (lb/hr) - provided	15.2	14.0	15.0	13.2
Volatile Organic Compounds				
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvw	1.04	1.02	1.08	0.99
Basis, ppmvd @ 15% O2 - given	1	1	1	1
Moisture (%)	7.1	7.75	9.22	9.14
Oxygen (%) wet	13.27	13.25	12.62	13.12
Turbine Flow (acfm)	2,188,271	2,108,229	2,227,379	2,070,770
Turbine Exhaust Temperature (°F)	1,006	1,032	1,108	1,083
HRSG Exhaust Temperature (°F)	190	190	190	190
CT/Bypass Stack Emission rate (lb/hr)	2.05	1.90	2.01	1.76
HRSG Stack emission rate (lb/hr)	2.05	1.90	2.01	1.76
HRSG Stack emission rate (lb/hr) - provided	2.13	2.00	2.10	1.83
Sulfuric Acid Mist				
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100				
CT SO_2 emission rate (lb/hr) - provided	9.1	8.5	8.7	7.9
CT Conversion to H_2SO_4 (% by weight) - provided	10	10	10	10
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0
DB Conversion to H_2SO_4 (%) - provided	20	20	20	20
CT/Bypass Stack Emission rate (lb/hr)	0.91	0.85	0.87	0.79
HRSG Stack emission rate (lb/hr)	0.91	0.85	0.87	0.79
Lead				
Lead (lb/hr) = NA				
Emission Rate Basis	NA	NA	NA	NA
HRSG Stack emission rate (lb/hr)	NA	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-5. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NOx Combustor, Natural Gas, 60% Load (Note: CC Performance Data Used)

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	8	NA
Combustion Turbine Performance				
Gross power output (MW)	120.13	108.54	108.128	93.99
Gross heat rate (Btu/kWh, LHV)	10,125	10,610	10,748	11,075
(Btu/kWh, HHV)	11,229	11,774	11,921	12,286
Heat Input (MMBtu/hr, LHV)	1,216	1,152	1,162	1,041
(MMBtu/hr, HHV)	1,349	1,278	1,289	1,155
Relative Humidity (%)	80	60	80	55
Fuel heating value (Btu/lb, LHV)	20,897	20,897	20,897	20,897
(Btu/lb, HHV)	23,181	23,181	23,181	23,181
(HHV/LHV)	1.109	1.109	1.109	1.109
CT Exhaust Flow				
Mass Flow (lb/hr)- with no margin	2,821,309	2,687,524	2,814,096	2,572,306
- provided	2,821,309	2,687,524	2,814,096	2,572,306
Temperature (°F)	1,088	1,112	1,108	1,083
Moisture (% Vol.)	7.18	7.89	8.91	9.17
Oxygen (% Vol.)	13.18	13.08	12.97	13.08
Molecular Weight	28.50	28.42	28.31	28.26
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,216	1,152	1,162	1,041
Heat content (Btu/lb, LHV)	20,897	20,897	20,897	20,897
Fuel usage (lb/hr)- calculated	58,190	55,128	55,606	49,816
Heat content (Btu/cf, LHV)- assumed	933	933	933	933
Fuel density (lb/ft3)	0.0447	0.0447	0.0447	0.0447
Fuel usage (cf/hr)- calculated	1,303,222	1,234,631	1,245,348	1,115,669
HRSG Stack				
CT/Bypass-Stack height (ft)	120	120	120	120
Diameter (ft)	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120
Diameter (ft)	18	18	18	18
CT Flow Conditions				
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	2,821,309	2,687,524	2,814,096	2,572,306
Temperature (°F)	1,088	1,112	1,108	1,083
Molecular weight	28.50	28.42	28.31	28.26
Volume flow (acfm)- calculated	1,864,140	1,808,157	1,896,176	1,708,519
(ft3/s)- calculated	31,069	30,136	31,603	28,475
Diameter (ft)	22.0	22.0	22.0	22.0
Velocity (ft/sec)- calculated	81.7	79.3	83.1	74.9

Table A-5. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NOx Combustor, Natural Gas, 60% Load (Note: CC Performance Data Used)

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	8	NA
HRSG Stack Flow Conditions				
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)^2 /4) x 3.14159] / 60 sec/min				
Mass flow (lb/hr)	2,821,309	2,687,524	2,814,096	2,572,306
HRSG Stack Temperature (oF)	190	190	190	190
Molecular weight	28.50	28.42	28.31	28.26
CT volume flow (acfm)	782,746	747,648	786,042	719,726
Diameter (ft)	18	18	18	18
Velocity (ft/sec)- calculated	51.3	49.0	51.5	47.1

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft^2; 14.7 lb/ft3.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-6. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, 60% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	74 °F	90 °F
	NA	NA	8	NA
Particulate from CTand SCR				
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only				
a. PM_{10} (front half) (lb/hr)				
CT- provided	8.0	8.0	8.0	8.0
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})				
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3				
SO_2 emission rate (lb/hr)- calculated	7.4	7.1	7.1	6.4
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100
MW $(NH_4)_2$ SO_4/ SO_3 (132/80)	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	1.51	1.43	1.44	1.29
CT emission rate (lb/hr) [a]	8.0	8.0	8.0	8.0
Total emission rate (lb/hr) [a + b]	9.5	9.4	9.4	9.3
(lb/mmBtu, HHV)	0.0067	0.0069	0.0069	0.0075
Sulfur Dioxide				
SO_2 (lb/hr)= Natural gas (scf/hr) x sulfur content(gr/100 scf) x 1 lb/7000 gr x (lb SO_2 /lb S) /100				
Fuel use (cf/hr)	1,303,222	1,234,631	1,245,348	1,115,669
Sulfur content (grains/ 100 cf)	2	2	2	2
lb SO_2 /lb S (64/32)	2	2	2	2
CT/Bypasss Stack, ppmvd @ 15% O_2	7.4	7.1	7.1	6.4
HRSG Stack emission rate (lb/hr)- calculated	7.4	7.1	7.1	6.4
Nitrogen Oxides				
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft^2 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT / DB, ppmvd @15% O_2	15	15	15	15
Moisture (%)	7.18	7.89	8.91	9.17
Oxygen (%)	13.18	13.08	12.97	13.08
Turbine Flow (acfm)	1,864,140	1,808,157	1,896,176	1,708,519
Turbine Exhaust Temperature (°F)	1,088	1,112	1,108	1,083
CT/DB Emission rate (lb/hr)	72.0	68.2	70.5	62.8
CT/Bypasss Stack, ppmvd @ 15% O_2	15	15	15	15
CT/Bypass Stack Emission rate (lb/hr)	72.00	68.24	70.54	62.84
CT/Bypass Stack Emission rate (lb/hr) - provided	72.00	68.14	73.33	63.00

Table A-6. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, 60% Load

Parameter	Turbine Inlet Temperature 20 °F	59 °F	74 °F	90 °F
	NA	NA	8	NA
Carbon Monoxide				
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd	13.08	13.25	13.44	13.25
Basis, ppmvd @ 15% O2 - given	10	10	10	10
Moisture (%)	7.18	7.89	8.91	9.17
Oxygen (%)	13.18	13.08	12.97	13.08
Turbine Flow (acfm)	1,864,140	1,808,157	1,896,176	1,708,519
Turbine Exhaust Temperature (°F)	1,088	1,112	1,108	1,083
HRSG Exhaust Temperature (°F)	190	190	190	190
CT/Bypass Stack Emission rate (lb/hr)	33.7	32.3	34.1	30.7
HRSG Stack emission rate (lb/hr)	33.7	32.3	34.1	30.7
HRSG Stack emission rate (lb/hr) - provided	30.8	29.2	30.0	26.4
Volatile Organic Compounds				
VOCs (lb/hr) = VOC(ppmvd) x [1-Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvw	4.22	4.18	4.11	4.00
Basis, ppmvd @ 15% O2 - given	4	4	4	4
Moisture (%)	7.18	7.89	8.91	9.17
Oxygen (%) wet	13.18	13.08	12.97	13.08
Turbine Flow (acfm)	1,864,140	1,808,157	1,896,176	1,708,519
Turbine Exhaust Temperature (°F)	1,088	1,112	1,108	1,083
HRSG Exhaust Temperature (°F)	190	190	190	190
CT/Bypass Stack Emission rate (lb/hr)	6.68	6.33	6.54	5.83
HRSG Stack emission rate (lb/hr)	6.68	6.33	6.54	5.83
HRSG Stack emission rate (lb/hr) - provided	7.1	6.7	6.8	6.1
Sulfuric Acid Mist				
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100				
CT SO_2 emission rate (lb/hr) - provided	7.4	7.1	7.1	6.4
CT Conversion to H_2SO_4 (% by weight) - provided	10	10	10	10
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0
DB Conversion to H_2SO_4 (%) - provided	20	20	20	20
CT/Bypass Stack Emission rate (lb/hr)	0.74	0.71	0.71	0.64
HRSG Stack emission rate (lb/hr)	0.74	0.71	0.71	0.64
Lead				
Lead (lb/hr) = NA				
Emission Rate Basis	NA	NA	NA	NA
HRSG Stack emission rate (lb/hr)	NA	NA	NA	NA

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-7. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NOx Combustor, Distillate Oil, Base Load (Note: CC Performance Data Used with SC Temperature)

Parameter	Turbine Inlet Temperature 35 °F	59 °F	74 °F	95 °F	95 °F
	10	8	2	3	4
Combustion Turbine Performance					
Gross power output (MW)	198.8	184.6	173.5	169.3	157.8
Gross heat rate (Btu/kWh, LHV)	9,353	9,523	9,708	9,793	9,982
(Btu/kWh, HHV)	9,976	10,160	10,359	10,450	10,650
Heat Input (MMBtu/hr, LHV)	1,859	1,758	1,685	1,658	1,575
(MMBtu/hr, HHV)	1,983	1,876	1,798	1,769	1,680
Evaporative Cooler	Off	Off	Off	85%	OFF
Relative Humidity (%)	60	60	80	44.7	44.7
Fuel heating value (Btu/lb, LHV)	18,514	18,514	18,514	18,514	18,514
(Btu/lb, HHV)	19,753	19,753	19,753	19,753	19,753
(HHV/LHV)	1.067	1.067	1.067	1.067	1.067
CT Exhaust Flow					
Mass Flow (lb/hr)- with margin if applicable	4,252,224	4,056,998	3,884,963	3,813,647	3,673,602
- provided	4,252,224	4,056,998	3,884,963	3,813,647	3,673,602
Temperature (°F)	1,030	1,044	1,065	1,072	1,084
Moisture (% Vol.)	6.51	7.03	8.21	8.94	8.35
Oxygen (% Vol.)	12.85	12.81	12.59	12.44	12.64
Molecular Weight	28.77	28.71	28.57	28.50	28.55
Fuel Usage					
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))					
Heat input (MMBtu/hr, LHV)	1,859	1,758	1,685	1,658	1,575
Heat content (Btu/lb, LHV)	18,514	18,514	18,514	18,514	18,514
Fuel usage (lb/hr)- calculated	100,411	94,955	91,012	89,554	85,071
HRSG Stack					
CT/Bypass-Stack height (ft)	120	120	120	120	120
Diameter (ft)	22	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120	120
Diameter (ft)	18	18	18	18	18
CT Flow Conditions					
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr					
Mass flow (lb/hr)	4,252,224	4,056,998	3,884,963	3,813,647	3,673,602
Temperature (°F)	1,030	1,044	1,065	1,072	1,084
Molecular weight	28.77	28.71	28.57	28.50	28.55
Volume flow (acfm)- calculated	2,678,517	2,585,590	2,522,288	2,493,999	2,416,744
(ft3/s)- calculated	44,642	43,093	42,038	41,567	40,279
Diameter (ft)	22	22	22	22	22
Velocity (ft/sec)- calculated	117.4	113.4	110.6	109.3	106.0

Table A-7. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NOx Combustor, Distillate Oil, Base Load (Note: CC Performance Data Used with SC Temperature)

Parameter	Turbine Inlet Temperature				
	35 °F	59 °F	74 °F	95 °F	95 °F
	10	8	2	3	4
HRSG Stack Flow Conditions					
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min					
Mass flow (lb/hr)	4,252,224	4,056,998	3,884,963	3,813,647	3,673,602
HRSG Stack Temperature (oF)	228	228	228	228	228
Molecular weight	28.77	28.71	28.57	28.50	28.55
CT volume flow (acfm)	1,236,792	1,182,770	1,137,924	1,120,020	1,076,891
(ft3/s)- calculated	20,613	19,713	18,965	18,667	17,948
Diameter (ft)	18	18	18	18	18
Velocity (ft/sec)- calculated	81.0	77.5	74.5	73.4	70.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft3.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-8. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, Base Load

Parameter	Turbine Inlet Temperature 35 °F	59 °F	74 °F	95 °F
	10	8	2	3
Particulate from CTand SCR				
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only				
a. PM_{10} (front half) (lb/hr)				
CT- provided	60.0	60.0	60.0	60.0
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})				
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3				
SO_2 emission rate (lb/hr)- calculated	100.4	95.0	91.0	89.6
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100
MW $(NH_4)_2SO_4$/ SO_3 (132/80)	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	20.30	19.19	18.40	18.10
CT emission rate (lb/hr) [a]	60.0	60.0	60.0	60.0
Total HRSG stack emission rate (lb/hr) [a + b]	80.3	79.2	78.4	78.1
(lb/mmBtu, HHV)	0.0405	0.0422	0.0436	0.0442
Sulfur Dioxide				
SO_2 (lb/hr)= Fuel oil (lb/hr) x sulfur content(% weight) x (lb SO_2 /lb S) /100				
Fuel oil Sulfur Content	0.0500%	0.0500%	0.0500%	0.0500%
Fuel oil use (lb/hr)	100,411	94,955	91,012	89,554
lb SO2 / lb S (64/32)	2	2	2	2
CT/Bypass Stack Emission rate (lb/hr)	100.4	95.0	91.0	89.6
HRSG Stack emission rate (lb/hr)- calculated	100.4	95.0	91.0	89.6
Nitrogen Oxides				
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft^2 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT/DB, ppmvd @15% O_2	42	42	42	42
Moisture (%)	6.51	7.03	8.21	8.94
Oxygen (%)	12.85	12.81	12.59	12.44
Turbine Flow (acfm)	2,678,517	2,585,590	2,522,288	2,493,999
Turbine Exhaust Temperature (°F)	1,030	1,044	1,065	1,072
CT/Bypasss Stack, ppmvd @ 15% O_2	42	42	42	42
CT/Bypass Stack Emission rate (lb/hr)	323.7	306.4	293.6	288.9
CT emission rate (lb/hr)(provided)	334.0	316.0	303.0	298.0

Table A-8. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, Base Load

Parameter	Turbine Inlet Temperature 35 °F	59 °F	74 °F	95 °F
	10	8	2	3
Carbon Monoxide				
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd	40.93	41.14	42.25	43.02
Basis, ppmvd @ 15% O2 - given	30	30	30	30
Moisture (%)	6.51	7.03	8.21	8.94
Oxygen (%)	12.85	12.81	12.59	12.44
Turbine Flow (acfm)	2,678,517	2,585,590	2,522,288	2,493,999
Turbine Exhaust Temperature (°F)	1,030	1,044	1,065	1,072
HRSG Exhaust Temperature (°F)	228	228	228	228
CT/Bypass Stack Emission rate (lb/hr)	158.3	151.3	147.7	146.8
HRSG Stack emission rate (lb/hr)	158.3	151.3	147.7	146.8
HRSG Stack emission rate (lb/hr)- provided	145.0	138.0	132.0	130.0
Volatile Organic Compounds				
VOCs (lb/hr) = VOC(ppmvd) x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvw	11.34	11.22	11.18	11.17
Basis, ppmvd @ 15% O_2	10.00	10.00	10.00	10.00
Moisture (%)	6.51	7.03	8.21	8.94
Oxygen (%)	12.85	12.81	12.59	12.44
Oxygen (%-dry)	13.74	13.78	13.72	13.66
Turbine Flow (acfm)	2,678,517	2,585,590	2,522,288	2,493,999
Turbine Exhaust Temperature (°F)	1,030	1,044	1,065	1,072
CT/Bypass Stack Emission rate (lb/hr)	26.81	25.37	24.31	23.92
HRSG Stack emission rate (lb/hr)	26.81	25.37	24.31	23.92
HRSG Stack emission rate (lb/hr)- provided	28.00	27.00	25.00	25.00
Sulfuric Acid Mist				
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100				
CT SO_2 emission rate (lb/hr) - provided	100.4	95.0	91.0	89.6
CT Conversion to H_2SO_4 (% by weight) - provided	20	20	20	20
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0
DB Conversion to H_2SO_4 (%) - provided	20	20	20	20
CT/Bypass Stack Emission rate (lb/hr)	20.08	18.99	18.20	17.91
HRSG Stack emission rate (lb/hr)- calculated	20.08	18.99	18.20	17.91
Lead				
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Emission Rate Basis (lb/10^{12} Btu)	14	14	14	14
HRSG Stack emission rate (lb/hr)- calculated	0.0260	0.0246	0.0236	0.0232

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-9. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 80% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	72 °F	105 °F
	NA	NA	NA	NA
Combustion Turbine Performance				
Gross power output (MW)	153.5	147.6	142.7	130.5
Gross heat rate (Btu/kWh, LHV)	9,642	9,295	9,335	9,412
(Btu/kWh, HHV)	10,287	9,917	9,959	10,040
Heat Input (MMBtu/hr, LHV)	1,480	1,372	1,332	1,228
(MMBtu/hr, HHV)	1,579	1,464	1,421	1,310
Fuel heating value (Btu/lb, LHV)	18,514	18,514	18,514	18,514
(Btu/lb, HHV)	19,753	19,753	19,753	19,753
(HHV/LHV)	1.067	1.067	1.067	1.067
CT Exhaust Flow				
Mass Flow (lb/hr)- with no margin	3,800,715	3,589,967	3,459,546	3,179,611
- provided	3,800,715	3,589,967	3,459,546	3,179,611
Temperature (°F)	1,120	1,140	1,150	1,170
Moisture (% Vol.)	5.85	6.53	7.6	9.9
Oxygen (% Vol.)	13.42	13.38	13.17	12.73
Molecular Weight	28.81	28.73	28.61	28.36
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,480	1,372	1,332	1,228
Heat content (Btu/lb, LHV)	18,514	18,514	18,514	18,514
Fuel usage (lb/hr)- calculated	79,940	74,106	71,946	66,328
HRSG Stack				
CT/Bypass-Stack height (ft)	120	120	120	120
Diameter (ft)	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120
Diameter (ft)	18	18	18	18
CT Flow Conditions				
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,800,715	3,589,967	3,459,546	3,179,611
Temperature (°F)	1,120	1,140	1,150	1,170
Molecular weight	28.81	28.73	28.61	28.36
Volume flow (acfm)- calculated	2,535,697	2,431,994	2,368,159	2,223,331
(ft^3/s)- calculated	42,262	40,533	39,469	37,056
Diameter (ft)	22	22	22	22
Velocity (ft/sec)- calculated	111.2	106.6	103.8	97.5

HRSG Stack Flow Conditions

Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min

Mass flow (lb/hr)	3,800,715	3,589,967	3,459,546	3,179,611
HRSG Stack Temperature (°F)	228	228	228	228
Molecular weight	28.81	28.73	28.61	28.36
CT volume flow (acfm)	1,104,152	1,045,757	1,011,983	938,437
Diameter (ft)	18	18	18	18
Velocity (ft/sec)- calculated	72.3	68.5	66.3	61.5

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft³.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-10. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 80% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	72 °F	105 °F
	NA	NA	NA	NA
Particulate from CTand SCR				
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only				
a. PM_{10} (front half) (lb/hr)				
CT- provided	60.0	60.0	60.0	60.0
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})				
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3				
SO_2 emission rate (lb/hr)- calculated	79.9	74.1	71.9	66.3
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100
MW $(NH_4)_2$ SO_4/ SO_3 (132/80)	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	16.16	14.98	14.54	13.41
CT emission rate (lb/hr) [a]	60.0	60.0	60.0	60.0
Total HRSG stack emission rate (lb/hr) [a + b]	76.2	75.0	74.5	73.4
(lb/mmBtu, HHV)	0.0477	0.0506	0.0518	0.0553
Sulfur Dioxide				
SO_2 (lb/hr)= Fuel oil (lb/hr) x sulfur content(% weight) x (lb SO_2 /lb S) /100				
Fuel oil Sulfur Content	0.0500%	0.0500%	0.0500%	0.0500%
Fuel oil use (lb/hr)	79,940	74,106	71,946	66,328
lb SO2 / lb S (64/32)	2	2	2	2
CT/Bypass Stack Emission rate (lb/hr)	79.9	74.1	71.9	66.3
HRSG Stack emission rate (lb/hr)- calculated	79.9	74.1	71.9	66.3
Nitrogen Oxides				
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft^2 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT/DB, ppmvd @15% O_2	42	42	42	42
Moisture (%)	5.85	6.53	7.6	9.9
Oxygen (%)	13.42	13.38	13.17	12.73
Turbine Flow (acfm)	2,535,697	2,431,994	2,368,159	2,223,331
Turbine Exhaust Temperature (°F)	1,120	1,140	1,150	1,170
CT emission rate (lb/hr)	270.3	251.9	243.2	224.0
CT/Bypasss Stack, ppmvd @ 15% O_2	42	42	42	42
CT/Bypass Stack Emission rate (lb/hr)	270.3	251.9	243.2	224.0

Table A-10. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 80% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	72 °F	105 °F
	NA	NA	NA	NA
Carbon Monoxide				
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd	38.03	38.24	39.31	41.54
Basis, ppmvd @ 15% O2 - given	30	30	30	30
Moisture (%)	5.85	6.53	7.6	9.9
Oxygen (%)	13.42	13.38	13.17	12.73
Turbine Flow (acfm)	2,535,697	2,431,994	2,368,159	2,223,331
Turbine Exhaust Temperature (°F)	1,120	1,140	1,150	1,170
HRSG Exhaust Temperature (°F)	228	228	228	228
CT/Bypass Stack Emission rate (lb/hr)	132.3	125.0	123.0	117.5
HRSG Stack emission rate (lb/hr)	132.3	125.0	123.0	117.5
Volatile Organic Compounds				
VOCs (lb/hr) = VOC(ppmvd) x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvw	10.61	10.43	10.41	10.34
Basis, ppmvd @ 15% O_2	10	10	10	10
Moisture (%)	5.85	6.53	7.60	9.90
Oxygen (%)	13.42	13.38	13.17	12.73
Turbine Flow (acfm)	2,535,697	2,431,994	2,368,159	2,223,331
Turbine Exhaust Temperature (°F)	1,120	1,140	1,150	1,170
CT/Bypass Stack Emission rate (lb/hr)	22.39	20.86	20.14	18.55
HRSG Stack emission rate (lb/hr)	22.39	20.86	20.14	18.55
Sulfuric Acid Mist				
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100				
CT SO_2 emission rate (lb/hr) - provided	79.9	74.1	71.9	66.3
CT Conversion to H_2SO_4 (% by weight) - provided	20	20	20	20
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0
DB Conversion to H_2SO_4 (%) - provided	20	20	20	20
HRSG Stack emission rate (lb/hr)- calculated	15.99	14.82	14.39	13.27
Lead				
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Emission Rate Basis (lb/10^{12} Btu)	14	14	14	14
HRSG Stack emission rate (lb/hr)- calculated	0.0207	0.0192	0.0186	0.0172

Note: ppmvd= parts per million, volume dry; O2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-11. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 65% Load

Parameter	Turbine Inlet Temperature 20 °F NA	59 °F NA	72 °F NA	105 °F NA
Combustion Turbine Performance				
Net power output (MW)	124.7	119.9	116.0	106.0
Net heat rate (Btu/kWh, LHV)	9,997	9,733	9,834	10,036
(Btu/kWh, HHV)	10,669	10,384	10,485	10,709
Heat Input (MMBtu/hr, LHV)	1,247	1,167	1,140	1,064
(MMBtu/hr, HHV)	1,330	1,245	1,216	1,135
Fuel heating value (Btu/lb, LHV)	18,514	18,514	18,514	18,514
(Btu/lb, HHV)	19,753	19,753	19,753	19,753
(HHV/LHV)	1.067	1.067	1.067	1.067
CT Exhaust Flow				
Mass Flow (lb/hr)- with no margin	3,491,217	3,298,903	3,219,964	3,009,818
- provided	3,491,217	3,298,903	3,219,964	3,009,818
Temperature (°F)	1,170	1,180	1,190	1,200
Moisture (% Vol.)	4.99	5.71	6.78	9.08
Oxygen (% Vol.)	14.12	14.04	13.83	13.41
Molecular Weight	28.87	28.79	28.66	28.41
Fuel Usage				
Fuel usage (lb/hr) = Heat Input (MMBtu/hr) x 1,000,000 Btu/MMBtu (Fuel Heat Content, Btu/lb (LHV))				
Heat input (MMBtu/hr, LHV)	1,247	1,167	1,140	1,064
Heat content (Btu/lb, LHV)	18,514	18,514	18,514	18,514
Fuel usage (lb/hr)- calculated	67,354	63,033	61,575	57,470
HRSG Stack				
CT/Bypass-Stack height (ft)	120	120	120	120
Diameter (ft)	22	22	22	22
HRSG - Stack Height (ft)	120	120	120	120
Diameter (ft)	18	18	18	18
CT Flow Conditions				
Turbine Flow (acfm) = [(Mass Flow (lb/hr) x 1,545 x (Temp. (°F)+ 460°F)] / [Molecular weight x 2116.8] / 60 min/hr				
Mass flow (lb/hr)	3,491,217	3,298,903	3,219,964	3,009,818
Temperature (°F)	1,170	1,180	1,190	1,200
Molecular weight	28.87	28.79	28.66	28.41
Volume flow (acfm)- calculated	2,397,803	2,286,301	2,255,019	2,139,484
(ft^3/s)- calculated	39,963	38,105	37,584	35,658
Diameter (ft)	22	22	22	22
Velocity (ft/sec)- calculated	105.1	100.2	98.9	93.8

Table A-11. Design Information and Stack Parameters for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 65% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	72 °F	105 °F
	NA	NA	NA	NA
<u>HRSG Stack Flow Conditions</u>				
Velocity (ft/sec) = Volume flow (acfm) / [((diameter)² /4) x 3.14159] / 60 sec/min				
Mass flow (lb/hr)	3,491,217	3,298,903	3,219,964	3,009,818
HRSG Stack Temperature (°F)	228	228	228	228
Molecular weight	28.87	28.79	28.66	28.41
CT volume flow (acfm)	1,012,079	959,131	940,274	886,726
Diameter (ft)	18	18	18	18
Velocity (ft/sec)- calculated	66.3	62.8	61.6	58.1

Note: Universal gas constant = 1,545 ft-lb(force)/°R; atmospheric pressure = 2,116.8 lb(force)/ft²; 14.7 lb/ft³.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-12. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 65% Load

Parameter	Turbine Inlet Temperature 20 °F NA	59 °F NA	72 °F NA	105 °F NA
Particulate from CTand SCR				
Total PM_{10} = PM_{10} (front half) + PM_{10} ($(NH_4)_2SO_4$) from SCR only				
a. PM_{10} (front half) (lb/hr)				
CT- provided	60.0	60.0	60.0	60.0
b. PM_{10} ($(NH_4)_2SO_4$) from SCR only = Sulfur trioxide from conversion of SO_2 converts to ammonium sulfate (= PM_{10})				
Particulate from conversion of SO_2 = SO_2 emissions (lb/hr) x conversion of SO_2 to SO_3 x lb SO_3/lb SO_2 x conversion of SO_3 to $(NH_4)_2SO_4$ x lb $(NH_4)_2SO_4$/ lb SO_3				
SO_2 emission rate (lb/hr)- calculated	67.4	63.0	61.6	57.5
Conversion (%) from SO_2 to SO_3	9.8	9.8	9.8	9.8
MW SO_3/ SO_2 (80/64)	1.3	1.3	1.3	1.3
Conversion (%) from SO_3 to $(NH_4)_2(SO_4)$	100	100	100	100
MW $(NH_4)_2$ SO_4/ SO_3 (132/80)	1.7	1.7	1.7	1.7
SCR Particulate (lb/hr)- calculated	13.61	12.74	12.45	11.62
CT emission rate (lb/hr) [a]	60.0	60.0	60.0	60.0
Total HRSG stack emission rate (lb/hr) [a + b]	73.6	72.7	72.4	71.6
(lb/mmBtu, HHV)	0.0553	0.0584	0.0596	0.0631
Sulfur Dioxide				
SO_2 (lb/hr)= Fuel oil (lb/hr) x sulfur content(% weight) x (lb SO_2 /lb S) /100				
Fuel oil Sulfur Content	0.0500%	0.0500%	0.0500%	0.0500%
Fuel oil use (lb/hr)	67,354	63,033	61,575	57,470
lb SO2 / lb S (64/32)	2	2	2	2
CT/Bypass Stack Emission rate (lb/hr)	67.4	63.0	61.6	57.5
HRSG Stack emission rate (lb/hr)- calculated	67.4	63.0	61.6	57.5
Nitrogen Oxides				
NOx (lb/hr) = NOx (ppmvd@ 15% O_2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft^2 x Volume flow (acfm) x 46 (mole. wgt NOx) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT/DB, ppmvd @15% O_2	42	42	42	42
Moisture (%)	4.99	5.71	6.78	9.08
Oxygen (%)	14.12	14.04	13.83	13.41
Turbine Flow (acfm)	2,397,803	2,286,301	2,255,019	2,139,484
Turbine Exhaust Temperature (°F)	1,170	1,180	1,190	1,200
CT/DB Emission rate (lb/hr)	227.2	212.7	208.0	194.0
CT/Bypasss Stack, ppmvd @ 15% O_2	42	42	42	42
CT/Bypass Stack Emission rate (lb/hr)	227.2	212.7	208.0	194.0

Table A-12. Maximum Emissions for Criteria Pollutants for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, 65% Load

Parameter	Turbine Inlet Temperature			
	20 °F	59 °F	72 °F	105 °F
	NA	NA	NA	NA
<u>Carbon Monoxide</u>				
CO (lb/hr) = CO(ppm) x [1 - Moisture(%)/100] x 2116.8 lb/ft^2 x Volume flow (acfm) x 28 (mole. wgt CO) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvd	34.47	34.88	35.95	38.08
Basis, ppmvd @ 15% O2 - given	30	30	30	30
Moisture (%)	4.99	5.71	6.78	9.08
Oxygen (%)	14.12	14.04	13.83	13.41
Turbine Flow (acfm)	2,397,803	2,286,301	2,255,019	2,139,484
Turbine Exhaust Temperature (°F)	1,170	1,180	1,190	1,200
HRSG Exhaust Temperature (°F)	29	29	29	28
CT/Bypass Stack Emission rate (lb/hr)	110.9	105.5	105.4	102.7
HRSG Stack emission rate (lb/hr)	110.9	105.5	105.4	102.7
<u>Volatile Organic Compounds</u>				
VOCs (lb/hr) = VOC(ppmvd) x 2116.8 lb/ft^2 x Volume flow (acfm) x 16 (mole. wgt as methane) x 60 min/hr / [1545 x (CT temp.(°F) + 460°F) x 1,000,000 (adj. for ppm)]				
Basis, ppmvw	9.72	9.60	9.58	9.48
Basis, ppmvd @ 15% O_2	10	10	10	10
Moisture (%)	4.99	5.71	6.78	9.08
Oxygen (%)	14.12	14.04	13.83	13.41
Turbine Flow (acfm)	2,397,803	2,286,301	2,255,019	2,139,484
HRSG Exhaust Temperature (°F)	1,170	1,180	1,190	1,200
CT/Bypass Stack Emission rate (lb/hr)	18.81	17.61	17.22	16.07
HRSG Stack emission rate (lb/hr)	18.81	17.61	17.22	16.07
<u>Sulfuric Acid Mist</u>				
Sulfuric Acid Mist (lb/hr)= SO_2 emission (lb/hr) x Conversion to H_2SO_4 (% by weight)/100				
CT SO_2 emission rate (lb/hr) - provided	67.4	63.0	61.6	57.5
CT Conversion to H_2SO_4 (% by weight) - provided	20	20	20	20
DB SO_2 emission rate (lb/hr) - provided	0	0	0	0
DB Conversion to H_2SO_4 (%) - provided	20	20	20	20
CT/Bypass Stack Emission rate (lb/hr)	13.47	12.61	12.32	11.49
HRSG Stack emission rate (lb/hr)- calculated	13.47	12.61	12.32	11.49
<u>Lead</u>				
Lead (lb/hr) = Basis (lb/10^{12} Btu) x Heat Input (MMBtu/hr) / 1,000,000 MMBtu/10^{12} Btu				
Emission Rate Basis (lb/10^{12} Btu)	14	14	14	14
HRSG Stack emission rate (lb/hr)- calculated	0.0175	0.0163	0.0160	0.0149

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-13. Regulated and Hazardous Air Pollutant Emission Factors and Emissions for the Bartow Repowering Project
Natural Gas-Firing Only

Parameter		Emission Rate (lb/hr) firing Natural Gas for Operating Conditions of Base Load (1)				Natural Gas Maximum Annual Emissions (TPY) (2)	
Ambient Temperature (°F):		35 °F	59 °F	59 °F w/ DB	95 °F w/PA	59 °F 1	59 °F 4
HIR (MMBtu/hr):		2,084	1,972	2,472	1,983	CT/HRSG	CTs/HRSGs
Sulfuric acid mist		1.15	1.09	1.73	1.09	4.8	19.1
HAPs (Section 112(b) of Clean Air Act)							
1,3-Butadiene		0.000896	0.000848	0.001063	0.000853	0.0037	0.0149
Acetaldehyde		0.0834	0.0789	0.0989	0.0793	0.3455	1.38
Acrolein		0.0133	0.0126	0.0158	0.0127	0.0553	0.221
Benzene		0.0250	0.0237	0.0297	0.0238	0.1036	0.415
Ethylbenzene		0.0667	0.0631	0.0791	0.0635	0.2764	1.105
Formadehyde		0.403	0.427	0.460	0.403	1.8712	7.48
Naphthalene		0.00271	0.00256	0.00321	0.00258	0.0112	0.0449
Polycyclic Aromatic Hydrocarbons (PAH)	(3)	0.00458	0.00434	0.00544	0.00436	0.0190	0.0760
Propylene Oxide		0.0604	0.0572	0.0717	0.0575	0.2505	1.002
Toluene		0.0688	0.0651	0.0816	0.0654	0.2850	1.14
Xylene		0.133	0.126	0.158	0.127	0.5527	2.21
Antimony		0.0	0.0	0.0	0.0	0.00	0.00
Arsenic		0.0	0.0	0.0	0.0	0.00	0.00
Beryllium		0.0	0.0	0.0	0.0	0.00	0.00
Cadmium		0.0	0.0	0.0	0.0	0.00	0.00
Chromium		0.0	0.0	0.0	0.0	0.00	0.00
Lead		0.0	0.0	0.0	0.0	0.00	0.00
Manganese		0.0	0.0	0.0	0.0	0.00	0.00
Mercury		0.0	0.0	0.0	0.0	0.00	0.00
Nickel		0.0	0.0	0.0	0.0	0.00	0.00
Selenium		0.0	0.0	0.0	0.0	0.00	0.00
HAPs (Total)		0.862	0.862	1.004	0.840	3.77	15.1

(1) Emissions based on the following emission factors and conversion factors for firing natural gas:

Emission Factors		Value	Reference
Sulfuric acid mist		5	%; Conversion of SO_2 to SO_3 in gas turbine
1,3-Butadiene	(a)	0.43	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Acetaldehyde		40	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Acrolein		6.4	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Benzene		12	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Ethylbenzene		32	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Formadehyde		0.091	ppmvd @15% O_2 (see Table 15a)
Naphthalene		1.3	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Polycyclic Aromatic Hydrocarbons (PAH)		2.2	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Propylene Oxide	(a)	29	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Toluene		33	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000. Database
Xylene		64	lb/10^{12} Btu; AP-42,Table 3.1-3. EPA 2000
Antimony		0.00E+00	
Arsenic		0.00E+00	
Beryllium		0.00E+00	
Cadmium		0.00E+00	
Chromium		0.00E+00	
Lead		0.00E+00	
Manganese		0.00E+00	
Mercury		0.00E+00	
Nickel		0.00E+00	
Selenium		0.00E+00	

(a) Based on 1/2 the detection limit; expected emissions are lower.

(2) Annual emissions based on ambient temperature of 59 °F firing natural gas for following hours: 8,760

(3) Assumed to be representative of Polycyclic Organic Matter (POM) emissions, a regulated HAP.

Table A-13a. Maximum Formaldehyde Emissions for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Natural Gas, Base Load

Parameter	CT Only Turbine Inlet Temperature 35 °F Case 15	59 °F Case 19	95 °F Case 28	59 °F Case 19 w/DB	95 °F Case 28	95 °F w/PA Case 8
Formaldehyde (CH_2O) MW = 30						
CH_2O (lb/hr) = CH_2O (ppmvd@ 15% O2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 30 (mole. wgt CH2O) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]						
CT, ppmvd @15% O_2	0.091	0.091	0.091	0.091	0.091	0.091
Moisture (%)	7.71	8.22	10.14	10.47	10.14	14.85
Oxygen (%)	12.67	12.64	12.26	11.35	12.26	11.19
Turbine Flow (acfm)	1,167,141	1,115,906	1,056,780	1,066,810	1,056,780	1,111,722
Turbine Exhaust Temperature (°F)	190	190	190	190	190	190
CT Emission rate (lb/hr)	0.452	0.427	0.403	0.460	0.403	0.430
CT Emission rate (lb/10^{12} Btu) (HHV)	216.9	216.7	216.7	180.9	170.8	216.7

Note: ppmvd= parts per million, volume dry; O_2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-14. Regulated and Hazardous Air Pollutant Emission Factors and Emissions for the Bartow Repowering Project
Natural Gas-Firing and Distillate Oil-Firing

Parameter		Emission Rate (lb/hr) Firing Distillate Fuel Oil (1)	Maximum Annual Emissions (TPY)			
		Base Load	Distillate Fuel Oil (2)		Natural Gas (4)	Natural Gas and Fuel Oil (5)
Ambient Temperature (°F):		59 °F				
			1	4	4	4
HIR (MMBtu/hr):		1,876	CT/HRSG	CTs/HRSGs	CTs/HRSGs	CTs/HRSGs
Sulfuric acid mist		19.0	9.50	38.0	19.1	54.9
HAPs (Section 112(b) of Clean Air Act)						
1,3-Butadiene		0.0300	0.0150	0.0600	0.0149	0.073
Acetaldehyde		0.00	0.00	0.00	1.38	1.2
Acrolein		0.00	0.00	0.00	0.221	0.20
Benzene		0.103	0.0516	0.2063	0.415	0.57
Ethylbenzene		0.00	0.00	0.00	1.105	0.98
Formadehyde		0.433	0.216	0.866	7.48	7.50
Naphthalene		0.0656	0.0328	0.1313	0.0449	0.171
Polycyclic Aromatic Hydrocarbons (PAH)	(3)	0.0750	0.0375	0.1501	0.0760	0.22
Propylene Oxide		0.00	0.00	0.00	1.002	0.89
Toluene		0.00	0.00	0.00	1.14	1.0
Xylene		0.00	0.00	0.00	2.21	2.0
Antimony		0.00	0.00	0.00	0.00	0.0
Arsenic		0.0206	0.01032	0.0413	0.00	0.041
Beryllium		0.000581	0.000291	0.001163	0.00	0.00116
Cadmium		0.00900	0.00450	0.01801	0.00	0.0180
Chromium		0.0206	0.01032	0.0413	0.00	0.041
Lead		0.0263	0.01313	0.0525	0.00	0.053
Manganese		1.48	0.741	2.96	0.00	3.0
Mercury		0.00225	0.001125	0.00450	0.00	0.0045
Nickel		0.00863	0.00431	0.01726	0.00	0.0173
Selenium		0.0469	0.0234	0.0938	0.00	0.094
HAPs (Total)		2.32	1.549	4.65	15.1	18.0

(1) Emissions based on the following emission factors and conversion factors for firing distillate fuel oil:

Emission Factors		Value	Reference
Sulfuric acid mist		5	%; Conversion of SO_2 to SO_3 in gas turbine
1,3-Butadiene	(a)	16	lb/10^{12} Btu; AP-42,Table 3.1-4. EPA 2000
Acetaldehyde		0.0	
Acrolein		0.0	
Benzene		55	lb/10^{12} Btu; AP-42,Table 3.1-4. EPA 2000
Ethylbenzene		0.0	
Formadehyde		0.091	ppmvd @15% O_2 (see Table 16a)
Naphthalene		35	lb/10^{12} Btu; AP-42,Table 3.1-4. EPA 2000
Polycyclic Aromatic Hydrocarbons (PAH)		40	lb/10^{12} Btu; AP-42,Table 3.1-4. EPA 2000
Propylene Oxide		0.0	
Toluene		0.0	
Xylene		0.0	
Antimony		0.0	
Arsenic	(a)	11	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Beryllium	(a)	0.31	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Cadmium		4.8	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Chromium		11	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Lead		14	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Manganese		790	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Mercury		1.2	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Nickel	(a)	4.6	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000
Selenium	(a)	25	lb/10^{12} Btu; AP-42,Table 3.1-5. EPA 2000

(a) Based on 1/2 the detection limit; expected emissions are lower.

(2) Annual emissions based on ambient temperature of 59 °F and firing fuel oil at base load for : 1,000 hours
(3) Assumed to be representative of Polycyclic Organic Matter (POM) emissions, a regulated HAP.
(4) Annual emissions based on maximum emissions presented for natural gas-firing
(5) Maximum total annual emissions based on 1,000 hours of fuel oil firing per CT.

Table A-14a. Maximum Formaldehyde Emissions for the Bartow Repowering Project
Siemens 501F, Dry Low NO_x Combustor, Distillate Oil, Base Load

Parameter	CT Only Turbine Inlet Temperature			
	35 °F	59 °F	74 °F	95 °F
	10	8	2	3
Formaldehyde (CH_2O) MW = 30				
CH_2O (lb/hr) = CH_2O (ppmvd@ 15% O2) x {[20.9 x (1-Moisture (%)/100] - Oxygen, dry(%)} x 2116.8 lb/ft2 x Volume flow (acfm) x 30 (mole. wgt CH2O) x 60 min/hr / [1545 x (CT temp.(°F) + 460) x (20.9-15) x 1,000,000 (adj. for ppm)]				
CT, ppmvd @15% O_2	0.091	0.091	0.091	0.091
Moisture (%)	6.51	7.03	8.21	8.94
Oxygen (%)	12.85	12.81	12.59	12.44
Exhaust Flow (acfm)	1,236,792	1,182,770	1,137,924	1,120,020
Exhaust Temperature (°F)	228	228	228	228
CT Emission rate (lb/hr)	0.457	0.433	0.415	0.408
CT Emission rate (lb/10^{12} Btu) (HHV)	230.7	230.8	230.8	230.7

Note: ppmvd= parts per million, volume dry; O2= oxygen.

Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Table A-15. Summary of Maximum Potential Annual Emissions for the CTs/HRSG for Combined Cycle Operations

Pollutant	Emissions (lb/hr)[a] – Maximum Hourly Emissions (lb/hr)[a] – Combined Cycle (CC)					Simple Cycle (SC)	
Fuel:	NG	NG	NG	NG	Oil	NG	Oil
Load:	100%	60%	100% w/DB	100% w/DB & PA	100%	100%	100%
One Combustion Turbine							
SO_2	10.9	7.06	13.6	14.6	95.0	10.88	95.0
PM/PM_{10}	11.2	9.4	14.3	14.4	79.2	9.00	60.0
NO_x	111.7	68.2	151.7	160.8	316.0	111.7	316.0
CO	20.3	32.3	40.3	43.4	151.3	20.3	151.3
VOC (as methane)	2.60	6.67	4.6	4.8	27.0	2.60	27.0
Sulfuric Acid Mist	1.09	0.71	1.64	1.7	19.0	1.09	19.0
HAPs	0.86	0.56	0.86	1.00	2.32	0.86	2.32
Lead	0.00	0.00	0.00	0.00	0.025	0.00	0.025
Four Combustion Turbines							
SO_2	43.5	28.2	54.6	58.4	380	43.5	380
PM/PM_{10}	44.8	37.7	57.0	57.8	317	36.0	240.0
NO_x	446.7	273.0	606.7	643.3	1264	447	1264
CO	81.2	129.3	161	174	605	81.2	605
VOC (as methane)	10.40	26.67	18.4	19.2	108.0	10.40	108.0
Sulfuric Acid Mist	4.35	2.82	6.56	6.94	76.0	4.35	76.0
HAPs	3.45	2.23	3.45	4.02	9.29	3.45	9.29
Lead	0.00	0.00	0.00	0.00	0.098	0.00	0.098

Operating Scenario	Maximum Emissions (tons/year) based on hours for							
SS/NG 100 % Load:	8760	7760	0	0	0	0	0	0
SS/OIL 100 % Load:	0	1000	0	0	0	0	0	0
CC/ NG 100 % Load	0	0	8,760	6,326	6,326	5,326	5,326	3,326
CC/ DB /NG100 % Load	0	0	0	2,434	746	2,434	746	746
CC/ DB&PA/NG100 % Load	0	0	0	0	1,688	0	1,688	1,688
CC/ OIL 100 % Load	0	0	0	0	0	1,000	1,000	1,000
CC/ NG 60 % Load	0	0	0	0	0	0	0	2,000
TOTAL	8,760	8,760	8,760	8,760	8,760 0	8,760	8,760	8,760
One Combustion Turbine								
SO_2	47.7	89.7	47.7	51.0	51.8	93.1	93.9	90.0
PM/PM_{10}	39.4	64.9	49.1	52.8	52.9	86.8	86.9	85.2
NO_x	489.1	591.3	489.1	537.8	545.5	639.9	647.7	604.3
CO	89.0	154.5	89.0	113.3	115.9	178.8	181.4	193.4
VOC (as methane)	11.4	23.6	11.4	13.8	14.0	26.0	26.2	30.3
Sulfuric Acid Mist	4.8	13.7	4.8	5.4	5.5	14.4	14.5	14.1
HAPs	3.8	4.5	3.8	3.8	3.9	4.5	4.6	4.3
Lead	0.000	0.012	0.000	0.000	0.000	0.012	0.012	0.012
Four Combustion Turbines								
SO_2	191	359	191	204	207	372	375	360
PM/PM_{10}	158	260	196.2	211.1	211.8	347	348	341
NO_x	1,956	2,365	1,956	2,151	2,182	2,560	2,591	2,417
CO	356	618	356	453	464	715	726	774
VOC (as methane)	45.6	94.4	45.6	55.3	56.0	104.1	104.8	121.0
Sulfuric Acid Mist	19.1	54.9	19.1	21.8	22.1	57.6	57.9	56.3
HAPs	15.1	18.0	15.1	15.1	15.6	18.0	18.5	17.3
Lead	0.000	0.0492	0.000	0.000	0.000	0.049	0.049	0.049

[a] Based on 59 °F ambient inlet air temperature.
Source: Siemens, 2006 - CT Performance Data; Golder, 2006.

Unit 1 Actual 2001 Emissions Rates

Average 2001 Data:

Heat Input	6,104,035	MMBtu/yr (HHV)
Operating Hours	7,141	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			6,942
NO_x*			1,336
CO†			100
VOCs‡			15
PM†			98
PM_{10}**			62

Sources: AOR, 2001
Golder, 2006

Unit 1 Actual 2002 Emissions Rates

Average 2002 Data:

Heat Input	4,853,540	MMBtu/yr (HHV)
Operating Hours	5,838	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			5686.000
NO_x*			1,042
CO†			78
VOCs‡			12
PM†			130
PM_{10}**			82

Sources: AOR, 2002
Golder, 2006

Unit 1 Actual 2003 Emissions Rates

Average 2003 Data:

Heat Input	6,669,197	MMBtu/yr (HHV)
Operating Hours	8,151	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			7,668
NO_x*			1,429
CO†			107
VOCs‡			16
PM†			190
PM_{10}**			120

Sources: AOR, 2003
Golder, 2006

Unit 1 Actual 2004 Emissions Rates

Average 2004 Data:

Heat Input	6,257,832	MMBtu/yr (HHV)
Operating Hours	7,807	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			5383
NO_x*			873
CO†			99.9
VOCs‡			17.2
PM†			87.2
PM_{10}**			54.96

Sources: AOR, 2004
Golder, 2006

Unit 1 Actual 2005 Emissions Rates

Average 2005 Data:

Heat Input	6,613,861	MMBtu/yr (HHV)
Operating Hours	7,785	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			5,224
NO_x*			933
CO†			106
VOCs‡			16
PM†			99
PM-10			63

Sources: AOR, 2000
Golder, 2006

Unit 2 Actual 2001 Emissions Rates

Average 2001 Data:

Heat Input	5,739,443	MMBtu/yr (HHV)
Operating Hours	7,047	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			6,530
NO_x*			786
CO†			94
VOCs‡			14
PM†			252
PM_{10}**			179

Sources: AOR, 2001
Golder, 2006

Unit 2 Actual 2002 Emissions Rates

Average 2002 Data:		
Heat Input	5,874,513	MMBtu/yr (HHV)
Operating Hours	7,006	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			6,351
NO_x*			790
CO†			94
VOCs‡			14
PM†			203
PM_{10}**			144

Sources: AOR, 2002
Golder, 2006

Unit 2 Actual 2003 Emissions Rates

Average 2003 Data:
Heat Input 5,576,328 MMBtu/yr (HHV)
Operating Hours 7,359 hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			6,414
NO_x*			749
CO†			89
VOCs‡			14
PM†			233
PM_{10}**			165

Sources: AOR, 2003
Golder, 2006

Unit 2 Actual 2004 Emissions Rates

Average 2004 Data:

Heat Input	6,597,722	MMBtu/yr (HHV)
Operating Hours	8,061	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			5,790
NO_x*			1,352
CO†			105
VOCs‡			16
PM†			216
PM_{10}**			153

Sources: AOR, 2004
Golder, 2006

Unit 2 Actual 2005 Emissions Rates

Average 2005 Data:

Heat Input	6,364,507	MMBtu/yr (HHV)
Operating Hours	7,678	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			5,060
NO_x*			1,296
CO†			102
VOCs‡			15
PM†			207
PM_{10}**			148

Sources: AOR, 2005
Golder, 2006

Unit 3 Actual 2001 Emissions Rates

Average 2001 Data:
Heat Input 9,492,162 MMBtu/yr (HHV)
Operating Hours 6,561 hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			9,899
NO_x*			1,399
CO†			144
VOCs‡			22
PM†			342
PM_{10}**			241

Sources: AOR, 2001
Golder, 2006

Unit 3 Actual 2002 Emissions Rates

Average 2002 Data:
Heat Input 10,832,431 MMBtu/yr (HHV)
Operating Hours 7,742 hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			10,457
NO_x*			1,605
CO†			158
VOCs‡			24
PM†			261
PM_{10}**			183

Sources: AOR, 2002
Golder, 2006

Unit 3 Actual 2003 Emissions Rates

Average 2003 Data:

Heat Input	11,295,762	MMBtu/yr (HHV)
Operating Hours	7,776	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			13,055
NO_x*			1,519
CO†			181
VOCs‡			28
PM†			397
PM_{10}**			282

Sources: AOR, 2003
Golder, 2006

Unit 3 Actual 2004 Emissions Rates

Average 2004 Data:		
Heat Input	9,674,596	MMBtu/yr (HHV)
Operating Hours	7,391	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			9,053
NO_x*			2,164
CO†			152
VOCs‡			23
PM†			485
PM_{10}**			344

Sources: AOR, 2004
Golder, 2006

Unit 3 Actual 2005 Emissions Rates

Average 2005 Data:

Heat Input	8,074,976	MMBtu/yr (HHV)
Operating Hours	5,898	hr/yr

Pollutant	Emissions Rate		
	lb/MMBtu	lb/hr	tpy
SO_2*			6,108
NO_x*			1,673
CO†			127
VOCs‡			19
PM†			423
PM_{10}**			301

Sources: AOR, 2004
Golder, 2006

Unit 1 Highest 2 Year Average

Pollutant	2001-2002 (tpy)	2002-2003 (tpy)	2003-2004 (tpy)	2004-2005 (tpy)	Highest 2 Year Average
SO_2	6,314	6,677	6,526	5,304	6,677
NO_x	1,189	1,236	1,151	903	1,236
CO	89	92	103	103	103
VOCs	14	14	17	17	17
PM	114	160	139	93	160
PM_{10}	72	101	87	59	101

Unit 2 Highest 2 Year Average

Pollutant	2001-2002 (tpy)	2002-2003 (tpy)	2003-2004 (tpy)	2004-2005 (tpy)	Highest 2 Year Average
SO_2	6,441	6,383	6,102	5,425	6,441
NO_x	788	770	1,051	1,324	1,324
CO	94	92	97	103	103
VOCs	14	14	15	16	16
PM	228	218	224	211	228
PM_{10}	162	155	159	150	162

Unit 3 Highest 2 Year Average

Pollutant	2001-2002 (tpy)	2002-2003 (tpy)	2003-2004 (tpy)	2004-2005 (tpy)	Highest 2 Year Average
SO_2	10,178	11,756	11,054	7,581	11,756
NO_x	1,502	1,562	1,842	880	1,842
CO	151	169	167	127	169
VOCs	23	26	25	19	26
PM	301	329	441	423	441
PM_{10}	212	232	313	301	313

Highest Baseline 2-Year Average

Pollutant	2001-2002 (tpy)	2002-2003 (tpy)	2003-2004 (tpy)	2004-2005 (tpy)	Highest 2 Year Average
SO_2	22,933	24,816	23,682	18,309	24,816
NO_x	3,479	3,567	4,043	3,107	4,043
CO	333	353	367	333	367
VOCs	51	54	57	52	57
PM	643	706	804	728	804
PM_{10}	446	488	559	510	559

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY FOR THE PROPOSED COMBUSTION TURBINES

APPENDIX B

BEST AVAILABLE CONTROL TECHNOLOGY FOR THE PROPOSED COMBUSTION TURBINES

B.1 NEW SOURCE PERFORMANCE STANDARDS

BACT is a case-by-case emission limitation for each applicable pollutant, based on the maximum degree of emission reduction after taking into account the energy, environmental, and economic impacts, and other costs. The BACT cannot be any less stringent than any applicable new source performance standards (NSPS) and consideration must be given to the applicable NSPS in the determination of BACT. This requirement also applies for any applicable National Emission Standard for Hazardous Air Pollutants promulgated under 40 CFR Part 61. For CTs the NSPS was previously contained in 40 CFR Part 60, Subpart GG Standards of Performance for Stationary Gas Turbines. The Subpart GG NSPS for CTs have a NO_x emission limit of 75 parts per million by volume, dry (ppmvd) corrected for heat rate and 15-percent O_2. The Subpart Da NSPS for the duct burner has a NO_x emission limit is 1.6 lb/MW-hr.

A new NSPS for Stationary Combustion Turbines and duct burners in a combined cycle configuration became effective on July 6, 2006. The NSPS, Subpart KKKK, has replaced Subparts GG and Da for combustion turbines with a peak load equal to or greater than 10.7 gigajoules (GJ) (10 million British thermal units (MMBtu)) per hour that commenced construction, modification, or reconstruction after February 18, 2005. The Subpart KKKK requirements supersede the Subparts GG and Da requirements. These NO_x emission standards are as follows:

Table B-1. NSPS 40 CFR 60, Subpart KKK -- NO_x Standards

Combustion Turbine Type	Heat Input at Peak Load (HHV)	NOx Emission Standard
New turbine firing natural gas, electric generating	≤ 50 MMbtu/hr	42 ppm at 15-percent O_2 or 290 ng/J of useful output (2.3 lb/MWh)
New turbine firing natural gas, mechanical drive	≤ 50 MMbtu/hr	100 ppm at 15-percent O_2 or 690 ng/J of useful output (5.5 lb/MWh)
New turbine firing natural gas	> 50 MMbtu/hr and ≤ 850 MMBtu/hr	25 ppm at 15-percent O_2 or 150 ng/J of useful output

		(1.2 lb/MWh)
New, modified, or reconstructed turbine firing natural gas	> 850 MMBtu/hr	15 ppm at 15-percent O_2 or 54 ng/J of useful output (0.43 lb/MWh)
New turbine firing fuels other than natural gas, electric generating	≤ 50 MMbtu/hr	96 ppm at 15-percent O_2 or 700 ng/J of useful output (5.5 lb/MWh)
New turbine firing fuels other than natural gas, mechanical drive	≤ 50 MMbtu/hr	150 ppm at 15-percent O_2 or 1,100 ng/J of useful output (8.7 lb/MWh)
New turbine firing fuels other than natural gas	> 50 MMbtu/hr and ≤ 850 MMBtu/hr	74 ppm at 15-percent O_2 or 460 ng/J of useful output (3.6 lb/MWh)
New, modified, or reconstructed turbine firing fuels other than natural gas	> 850 MMBtu/hr	42 ppm at 15-percent O_2 or 160 ng/J of useful output (1.3 lb/MWh)
Modified or reconstructed turbine	≤ 50 MMbtu/hr	150 ppm at 15-percent O_2 or 1,100 ng/J of useful output (8.7 lb/MWh)
Modified or reconstructed turbine firing natural gas	> 50 MMbtu/hr and ≤ 850 MMBtu/hr	42 ppm at 15-percent O_2 or 250 ng/J of useful output (2.0 lb/MWh)
Modified or reconstructed turbine firing fuels other than natural gas	> 50 MMbtu/hr and ≤ 850 MMBtu/hr	96 ppm at 15-percent O_2 or 590 ng/J of useful output (4.7 lb/MWh)
Turbines located north of the Arctic Circle (lat. 66.5 degrees north), turbines operating at less than 75 percent of peak load, modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0 deg. F.	≤ 30 MW output	150 ppm at 15-percent O_2 or 1,100 ng/J of useful output (8.7 lb/MWh)
Turbines located north of the Arctic Circle (lat. 66.5 degrees north), turbines operating at less than 75 percent of peak load,	> 30 MW output	96 ppm at 15-percent O_2 or 590 ng/J of useful output (4.7 lb/MWh)

modified and reconstructed offshore turbines, and turbine operating at temperatures less than 0 deg. F.		
Heat recovery units operating independent of the combustion turbine	All sizes	54 ppm at 15-percent O_2 or 110 ng/J of useful output (0.86 lb/MWh)

The CT emissions rate, when firing natural gas, of 15 ppmvd corrected to 15-percent O_2 is equivalent to the Subpart KKKK NSPS standard. When firing light oil, the proposed NO_x emission rate of 42 ppmvd corrected to 15-percent O_2 is also equivalent to the Subpart KKKK NSPS standard.

For the Project, the following NSPS emission standards for SO_2 apply:

- Emissions of SO2 less than or equal to 110 nanograms per Joule (ng/J) (0.90 pounds per megawatt-hour (lb/MWh) gross output, or
- Fuels containing total potential sulfur emissions less than or equal to 26 ng SO2/J (0.060 lb SO2/MMBtu) heat input. If the turbine simultaneously fires multiple fuels, each fuel must meet this requirement.

The proposed SO2 emission limits for the Project in combined- and simple- cycle mode will result in 0.0005 lb/MMBtu and 0.005 lb/MMbtu for natural gas firing and distillate fuel oil, respectively. These levels are greater than 1/100th and 1/10th of the NSPS when firing natural gas and distillate oil, respectively. In addition, the Project will utilize natural gas and distillate fuel oil with fuel sulfur content limits of 0.05 percent sulfur and 2 grains of sulfur per 100 standard cubic feet, for oil and gas, respectively. The sulfur content limitiations will ensure compliance with the above standards.

B.2 BEST AVAILABLE CONTROL TECHNOLOGY

The "top-down" analysis for determining BACT, as provided for in EPA's Draft 1990 New Source Review Workshop Manual was considered in evaluating BACT for the Project. The procedure involves five steps: identification of control technologies, elimination of technically infeasible control technologies, a ranking of the control technologies, an evaluation of the effective control technologies, and the selection of BACT.

The identification of control technologies is developed from the information obtained from BACT/lowest achievable emission rate (LAER) Information System (BLIS) database maintained at EPA's National Computer Center located at Research Triangle Park, North Carolina. While these data are comprehensive it is often not up to date with the most recent BACT/LAER decisions and separate contact with state agencies is required. LAER is distinctly different from BACT in that there is no consideration of economic, energy, or environmental impacts; if a control technology has previously been installed, it must be required as LAER. LAER is defined as follows:

> Lowest achievable emission rate means, for any source, the more stringent rate of emissions based on the following: (i) The most stringent emissions limitation which is contained in the implementation plan of any State of such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or (ii) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance (40 CFR 51, Appendix S.II, A.18).

The elimination of infeasible technologies is based on those engineering aspects that would preclude a technology's use due to physical, chemical or other engineering consideration. Control technologies that are technically feasible are ranked by control effectiveness, with determination of the environmental, economic and energy costs; and benefits of the control technologies. This information forms the basis for the case-by-case consideration of environmental, energy, and economic impacts. The "top" feasible control alternative is selected unless it can be rejected based on economic, environmental, or energy considerations. This section of Appendix B presents additional information related to the proposed BACT emission limitation.

B.2.1 CARBON MONOXIDE

Identification of CO Control Technologies

Carbon monoxide (CO) emissions are a result of incomplete or partial combustion of fossil fuel. Combustion design and catalytic oxidation are the viable control alternatives for the project. Table B-2 presents a listing of LAER/BACT decisions for CO emissions from CTs, with combustion design as the common control technique used in CTs. Sufficient time, temperature, and turbulence are required within the combustion zone to maximize combustion efficiency and minimize the emissions of CO. Combustion efficiency is dependent upon the combustor design.

Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with combustion controls alone. These installations have been required to use LAER technology and typically have CO limits less than 10 ppmvd (corrected to dry conditions).

Technology Description

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst, such as platinum. Combustion of CO starts at about 300°F, with an efficiency of 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required. The oxidation catalyst can be located directly after the CT, with catalyst size dependent upon the exhaust flow, temperature, and desired efficiency.

Oxidation Catalyst Costs

Tables B-3 through B-6 present the capital and annualized costs for an oxidation catalyst installed in the HRSG of each CT/HRSG option.

Comparison of Economic, Environmental, and Energy Impacts

Tables B-5 and B-6 present a comparison of the economic, environmental, and energy impacts associated with the top control alternatives for each combined cycle unit. Tables B-5 and B-6 presents the potential emissions resulting from secondary emissions. Secondary emissions result from generation lost due to the back pressure of the oxidation catalyst. There would also be no secondary benefits, such as reducing acidic deposition, to reducing CO.

Table B-2. Summary of BACT Determinations for CO for Combined Cycle CTs, 2001-2006

Facility	State	Final Permit Issued	# of New MW	# of CTs	# of DB	Turbine Model	Fuel	Mode	Hours	CO Limit	Control Method	Avg. Time	Comments
Georgia Power - Goat Rock (revision of above PSD application)	AL	4-01	2,460	8	8	GE 7FA (170 MW)	NG	CC	8,760	0.086 lb/MMBtu	GCP		
South Eastern Energy Corp.	AL	1-01	1,500	6	6 if CC	GE 7FA or SW 501F	NG	SC or CC	8,760	9 or 19 or 22 ppm	GCP		For NOx and CO: SC w/GE or SC w/SW501F or CC (either)
Tenaska Alabama II Generating Station	AL	2-01	900	3	3	GE 7FA or Mitsubishi M501F	NG; FO	CC	8,760; 720 FO	0.037/0.047/0.089 lb/mmbtu (base/PA/FO) - GE; 0.088/0.116/0.35 lb/mmbtu (base/PA/FO) Mit	GCP		
Hillabee Energy Center	AL	1-01	700	2	2	SW501G (229 MW)	NG	CC	8,760	0.023/0.076 lb/mmBtu (w/PA and/or DB)	GCP		PA = Power Augmentation, DB= Duct Burning
Duke Energy - Alexander City	AL	2-01	1,260	10	2	GE 7FA & 7EA	NG	CC & SC	8,760 CC; 2,500 SC	0.059 lb/mmBtu (130 lb/hr) CC; 0.09 lb/mmBtu (80 lb/hr) SC	GCP		8 SC units and 2 CC units
GenPower - Kelly, LLC	AL	1-01	1,260	4	4	GE 7FA (170 MW)	NG	CC	8,760	9 ppm, 14 ppm (w/DB)	GCP		
Blount County Energy	AL	1-01	800	3	3	"F" Class (170 MW)	NG	CC	8,760	0.033 lb/mmBtu (77.7 lb/hr)	GCP		
Calhoun Power Company	AL	1-01	680	4	0	GE 7FA (170 MW)	NG; FO	SC	4,000; 1,000 F0	0.017/0.064/0.026 lbmmbtu (NG/FO/peak)	GCP		NOx-(annual avg./1-hr avg./peak mode)
Alabama Power - Autaugaville	AL	1-01	1,260	4	4	"F" Class (170 MW)	NG	CC	8,760	0.035 lb/mmBtu	GCP		
Tenaska Alabama III Partners	AL	1-01	510	3	0	GE 7FA (170 MW)	NG; FO	SC	3,066; 720 FO	15 ppm	GCP		
Tenaska Alabama IV Partners	AL	10/09/2001	1,840	6	6	Mit 501F (170 MW)	NG; FO	CC	8,760; 720 FO	0.088 lb/mmBtu NG (0.115 w/PA & DB); 0.35 lb/mmBtu FO	GCP		SCONOx - $6,145/ton NOX; CatOx-$1,506/ton CO
Duke Energy Autauga, LLC	AL	10/29/2001	630	2	2	GE 7FA (170 MW)	NG	CC	8,760	15 ppm	GCP		SCONOx - $18760/ton NOX; CatOx-$5,006/ton CO
Duke Energy Dale, LLC	AL	12/17/2001	630	2	2	GE 7FA (170 MW)	NG	CC	8,760	0.033 lb/mmbtu	GCP		SCONOx - $18,403/ton NOX; CatOx-$2,634/ton CO+VOC
Barton Shoals Energy, LLC	AL	07/15/2002	1,200	4	4	GE 7FA (170 MW)	NG	CC	8,760	10 ppm (0.022 lb/mmbtu); 0.041 lb/mmbtu w/DB	GCP		EPA did not received application until 5/24/02
ExxonMobil Production Co.	AL	02/01/2005	15	2	0	Solar	NG	SC	8,760	50 ppm	GCP		1 CT on each of 2 Offshore Platforms
Calpine Osprey Energy Center	FL	07/05/2001	527	2	2	SW 501FD (170 MW)	NG	CC	8,760	10 ppm (17 ppm w/DB or PA)	GCP	24-hr Block	2,800 hr/yr - Power Aug. mode
Hines Energy (FPC)	FL	06/07/2001	530	2	0	SW 501FD (170 MW)	NG; FO	CC	8,760; 1,000 FO	16 ppm NG; 30 ppm FO	GCP	24-hr Block	SCONOx - $16,712/ton NOx.; CatOx - $2,130/ton CO
CPV - Gulfcoast	FL	2-01	250	1	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 720 FO	9 ppm NG; 20 ppm FO	GCP		SCONOx - no cost eval.; CatOx - $4,350/ton CO
TECO Gannon/Bayside	FL	3-01	1,728	7	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 876 FO	7.2 ppm NG; 14.2 ppm FO	GCP		Repowering project: netting out of NOx, CO, PM10 and SO2 review (subject to VOC reveiw)
Duke Energy - Ft. Pierce	FL	06/18/2001	640	8	0	GE 7EA (80 MW)	NG; FO	SC	2,500; 1,000 FO	25 ppm NG; 20 ppm FC	GCP	3-hr test	SCR - $50,602/ton NOx; CatOx - $21,832/ton CO&VOC
Pompano Beach Energy Center, LLC	FL	draft permit	510	3	0	GE 7FA (170 MW)	NG; FO	SC	3,500; 1,500 FO	9 ppm NG; 20 ppm FO	GCP		Hot SCR - $20,400/ton NOX; CatOx-$31,800/ton CO
Midway Development Center	FL	2-01	510	3	0	GE 7FA (170 MW)	NG; FO	SC	3,500; 1,500 FO	9 ppm NG; 20 ppm FO	GCP		Hot SCR - $20,700/ton NOX; CatOx-$31,800/ton CO
South Pond Energy Park	FL	draft permit	600	3	0	GE 7FA (170 MW)	NG; FO	SC/CC	3,390/8,760; 720 FO	9 ppm NG; 20 ppm FO	GCP	3-hr	2 SC CT and 1 CC CT also capable of operating in SC mode.
North Pond Energy Park	FL	applic. under review	430	2	0	GE 7FA (170 MW)	NG; FO	SC/CC	3,390/8,760; 720 FO	9 ppm NG; 20 ppm FO	GCP		1 SC CT and 1 CC CT also capable of operating in SC mode.
Duke Energy Lake	FL	07/18/2001	640	8	0	GE 7EA (80 MW)	NG	SC	2,500	20 ppm (25 ppm first year)	GCP	3-hr test	SCR - $15,000/ton NOx; CatOx - $5,563/ton CO

Table B-2. Summary of BACT Determinations for CO for Combined Cycle CTs, 2001-2006

Facility	State	Final Permit Issued	# of New MW	# of CTs	# of DB	Turbine Model	Fuel	Mode	Hours	CO Limit	Control Method	Avg. Time	Comments
Calpine Blue Heron Energy Center	FL	draft permit	1,080	4	4	SW 501F (170 MW)	NG	CC	8,760	10/15.6/38.5/50 ppm	GCP		base/duct burner/power aug./60-70% load; SCONOx - $9,982/ton NOx; CatOx - $1.553/ton CO
Jacksonville Electric Authority - Brandy Branch (revision)	FL	03/29/2002	200	0	2	GE 7FA (170 MW)	NG; FO	CC	8760; 288 FO	14 ppm	GCP	24-hr	Conversion of 2 SC units to 2 CC units
CPV - Atlantic Power	FL	05/03/2001	250	1	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 720 FO	9 ppm NG (15 ppm w/PA) ; 20 ppm FO	GCP		PA = Power Augmentation
Orlando Utilities - Curtis H Stanton Energy Center	FL	09/26/2001	633	2	2	GE 7FA (170 MW)	NG; FO	CC	8,760; 1000 FO	18.1 ppm NG (26.3 w/PA); 14.3 ppm FO	GCP		
Deerfield Beach Energy Center	FL	draft permit	510	3	0	GE 7FA (170 MW)	NG; FO	SC	3,500; 1000 FO	9 ppm NG; 20 ppm FO	GCP		
Broward Energy Center	FL	05/15/2002	775	4	0	GE 7FA (175 MW)	NG	CC/SC	8,760/5,000	8 ppm (SC & CC); 12 ppm (CC w/PA)	GCP	3-hr	1 CC w/unfired HRSG & 3 SC; PA = Power Augmentation
Belle Glade Energy Center	FL	01/28/2002	600	3	0	GE 7FA (175 MW)	NG	CC/SC	8,760/5,000	2.5 ppm (CC)/8 ppm (SC); 14 ppm (CC w/PA)	GCP	3-hr	1 CC w/unfired HRSG & 2 SC; PA = Power Augmentation
Manatee Energy Center	FL	01/17/2002	600	3	0	GE 7FA (175 MW)	NG	CC/SC	8,760/5,000	2.5 ppm/8 ppm; 4 ppm (CC w/PA)	GCP	3-hr	1 CC w/unfired HRSG & 2 SC; PA = Power Augmentation
CPV Pierce Power Generation Facility	FL	08/17/2001	250	1	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 720 FO	8 ppm NG (13 ppm w/PA) ; 17 ppm FO (19 ppm 76-89% load, 26 ppm 50-75% load)	GCP	24-hr	PA limited to 2,000 hr/yr
Fort Pierce Repowering Project	FL	08/15/2001	180	1	1	SW 501F (180 MW)	NG; FO	CC/SC	8,760; 1,000 FO/2,000; 500 FO	3.5 ppm NG; 10 ppm FO/ 16 ppm NG; 50 ppm FO	GCP		CT will operate in both CC and SC modes
TECO Bayside Power Station (repowering)	FL	01/09/2002	1,032	4	0	GE 7FA (170 MW)	NG	CC	8,760	9 ppm (7.8 ppm test avg.)	GCP	24-hr	Repowering Project: Netting out of PSD for NOx, SO2, lead and SAM (subject for PM10, VOC and CO)
CPV Cana Power Generation Facility	FL	01/17/2002	245	1	1	GE 7FA (170 MW)	NG; FO	CC	8,760; 720 FO	8 ppm NG (13 ppm w/PA) ; 17/19/26 ppm FO	GCP	24-hr	PA limited to 2,000 hr/yr; CO w/FO: 90-100%/76-89%/50-75% load
FPL Martin	FL	04/16/2003	1,150	4	0	GE 7FA (170 MW)	NG; FO	CC/SC	8,760; 5000 FO/1,000; 500 FO	10 ppm NG/8 ppm NG (12 ppm w/PA); 15 ppm FO	GCP	24-hr	PA = Power Augmentation
FPL Manatee	FL	04/15/2003	1,150	4	4	GE 7FA (170 MW)	NG	CC/SC	8,760/1,000	10 ppm NG/8 ppm NG (12 ppm w/PA)	GCP	24-hr	PA = Power Augmentation
FPC - Hines Energy Complex	FL	09/19/2003	530	2	0	SW 501FD (170 MW)	NG; FO	CC	8,760; 720 FO	10 ppm NG/20 ppm FO	GCP	24-hr	SCONOx - $8,597/ton NOx;
FPL Turkey Point	FL	02/08/2005	1,150	4	4	GE 7FA (170 MW)	NG; FO	CC	8,760; 500 FO	4.1 ppm NG/7.6 ppm NG w/DB/8 ppm NG w/PA&DB/14ppm w/PK&DB; 8.0 ppm FO/ & 6.0 ppm (12-month avg.)All modes	GCP	24-hr/12-mo	SCR (3.5ppm) = $3,744/ton NOx; SCR (2.5 ppm) = $3,753/ton NOx
Progress Energy - Hines ENergy Complex (unit 4)	FL	draft	530	2	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 1,000 FO	8 ppm NG/12 ppm FO	GCP	24-hr	
City of Tallahassee - Hopkins	FL	10/26/2004	100	2	0	GE LM6000	NG; FO	SC	5,840; 4,000 FO	6 ppm	CatOX	24-hr	
Seminole Electric Cooperative - Payne Creek	FL	draft	448	10	0	P&W FT-8 twin pacs	NG; FO	SC	2,500; 500 FO		CatOX		Not subject to PSD for CO
Keys Energy Services - Stock Island	FL	applic. under review	48	1	0	GE LM6000	FO	SC	4,000		GCP		Not subject to PSD for CO
Duke Energy Murray, LLC	GA	2-01	1,240	4	4	GE 7FA (170 MW)	NG	CC	8,760	12 ppm*	GCP		NOx and CO BACT limits were lowered from 3.5 ppm and 22 ppm after the permit was issued in response to a settlement with
Duke Energy Buffalo Creek, LLC	GA	applic. under review	620	2	2	GE 7FA (170 MW)	NG	CC	8,760	21.9 ppm	GCP		SCONOx - $19,948/ton NOx; CatOx - $2,469/ton CO
Duke Energy Sandersville, LLC	GA	11/09/2001	640	8	0	GE 7EA (80 MW)	NG; FO	SC	2,500; 500 FO	25 ppm NG; 20 ppm FO	GCP		Hot SCR - $36,520/ton NOx; CatOx - $8,330/ton CO
Augusta Energy LLC	GA	09/28/2001	750	3	3	GE 7FA (170 MW)	NG; FO	CC	8,760; 1,000 FO	2 ppm NG; 2 ppm FO	CatOx		SCONOx - $17,490/ton NOx; CatOx - $1,828/ton CO

Table B-2. Summary of BACT Determinations for CO for Combined Cycle CTs, 2001-2006

Facility	State	Final Permit Issued	# of New MW	# of CTs	# of DB	Turbine Model	Fuel	Mode	Hours	CO Limit	Control Method	Avg. Time	Comments
Oglethorpe Power Corp. - Talbot	GA	08/09/2001	648	6	0	SW V84.2 (108 MW)	NG; FO	SC	8,760; 500 FO	15 ppm	GCP		Hot SCR - $9,381/ton NOx; CatOx - $3,980/ton CO
Oglethorpe Power Corp.- Wansley	GA	01/15/2002	521	2	2	SW V84.3a2 (167 MW)	NG	CC	8,760	2.0 ppm	CatOx		
GenPower Rincon	GA	03/24/2003	528	2	2	GE 7FA (170 MW)	NG	CC	8,760	2.0 ppm	CatOx		
Effingham Power Co.	GA	12/27/2001	525	2	0	GE 7FA (170 MW)	NG	SC/CC	8,760	9 ppm	GCP		Initially SC, but later converting to CC
Peace Valley Generation Co., LLC	GA	draft permit	1,550	6	4	GE 7FA (170 MW)	NG	CC/SC	8,760/2,500	2.0 ppm/8.0 ppm	CatOx/GCP	3-hr	
MEA of Georgia - W. R. Clayton	GA	draft permit	500	3	0	GE 7FA (170 MW)	NG; FO	SC	8,760; 1,500 FO	13.1 ppm NG; 32.40 ppm FO	GCP	24-hr	Hot SCR - $14,100/ton NOx; CatOx - $15,000/ton CO
Savannah Electric and Power - Plant McIntosh	GA	04/17/2003	1,260	4	4	GE 7FA (170 MW)	NG; FO	CC	8,760; 1,000 FO	2.0 ppm	CatOx		After June 1, 2007 - FO must have < 0.0015%S (ultra low S diesel)
Live Oak Co., LLC	GA	02/04/2004	600	2	2	SW 501FD (170 MW)	NG	CC	8,760	10 ppm (17 ppm w/DB or PA)	GCP		
Big River Power, LLC	GA	applic. under review	855	3	3	GE 7FA (170 MW)	NG; FO	CC	8,760; 500 FO	19.2 ppm (w/DB)/9.0 ppm (w/o DB) NG; 20.o ppm FO	GCP		SCR - $5,075/ton NOx; CatOx - $4,712/ton CO
Kentucky Pioneer Energy	KY	06/08/2001	540	2	0	GE 7FA (197 MW)	syngas/NG	CC	8,760	15/20 ppm	GCP	3-hr	
Duke Energy - Marshall Co.	KY	draft permit	640	8	0	GE 7EA (80 MW)	NG; FO	SC	2,500; 500 FO	20 ppm NG; 25 ppm FO	GCP		
Duke Energy Metcalfe	KY	draft permit	640	8	0	GE 7EA (80 MW)	NG	SC	2,500	25 ppm	GCP	1-hr	
East Kentucky Power Cooperative, Inc.	KY	07/27/2001	240	3	0	GE 7EA (80 MW)	NG; FO	SC	8760; 8,760 FO	25 ppm NG; 20 ppm FO	GCP		CatOx - $8,000/ton CO
Louisville Gas & Electric - Trimble	KY	06/26/2001	960	6	0	GE 7FA (160 MW)	NG	SC	8,760	9 ppm	GCP	3-hr	
Westlake Energy Corp.	KY	draft permit	520	2	2	"F" Class (180 MW)	NG	SC	8,760	17.2 ppm	GCP		
Duke Energy Trimble	KY	applic. under review	1,240	4	4	GE 7FA (160 MW)	NG; FO	CC	8,760; 1,000 FO	9/13.9/20 ppm	GCP		
Summer Shade Development Co.	KY	applic. under review	680	4	0	GE 7FA (170 MW)	NG	SC	4,000	9 ppm	GCP		
Dynegy - Riverside Generating	KY	applic. under review	850	5	0	SW 501FD (170 MW)	NG	SC	4,000	118 lb/hour	GCP		Modification to increase hours of operation - proposes 2 CTs w/Hot SCR
Cogentrix Energy, Caledonia Power Project	MS	3-01	800	3	3	GE 7FA (182 MW)	NG	CC	8,760	9 ppm	GCP		revised application to add SCR
Warren Power LLC (revision)	MS	05/30/2001	320	4	0	GE 7EA (80 MW)	NG	SC	2,000	25 ppm	GCP	24-hr	revised to include startup/shutdown emissions in PTE and modeling analysis
Lone Oak Energy Center	MS	11/13/2001	800	3	3	F" Class (180 MW)	NG	CC	8,760	10/25/30/17 ppm	GCP		Base/PA/PA+DF/DF
Lee Power Partners	MS	03/09/2001	1,000	4	4	F" Class (170 MW)	NG	CC	8,760	25 ppm	GCP		
Duke Energy Enterprise	MS	05/10/2001	160	2	0	GE 7EA (80 MW)	NG; FO	SC	3,000; 500 FO	20 ppm NG; 25 ppm FO	GCP		
LSP-Pike Energy LLC	MS	11/14/2000	1,100	4	4	F" Class (170 MW)	NG	CC	8,760	33.1 ppm (0.15 lb/mmBTU)	GCP		
Magnolia Energy	MS	05/31/2001	900	3	3	F" Class (170 MW)	NG	CC	8,760	25 ppm	GCP		
MEP Clarksdale Power	MS	04/19/2001	320	4	0	GE 7EA (80 MW)	NG	SC	8,760	25 ppm	GCP		Hot SCR - $26,567/ton NOx; CatOx - $5,593/ton CO
TVA - Kemper CT Plant	MS	07/30/2001	440	4	0	GE 7EA (110 MW)	NG; FO	SC	see comment	25 ppm NG; 20 ppm FO	GCP		10% NG base mode, 10% NG peaking, 10% FO base; Hot SCR - $13,668/ton NOx; CatOx - $8,036/ton CO

Table B-2. Summary of BACT Determinations for CO for Combined Cycle CTs, 2001-2006

Facility	State	Final Permit Issued	# of New MW	# of CTs	# of DB	Turbine Model	Fuel	Mode	Hours	CO Limit	Control Method	Avg. Time	Comments
Reliant Energy - Choctaw Co., LLC	MS	06/13/2001	844	3	3	GE 7FA (170 MW)	NG	CC	8,760	18.36 ppm	GCP		SCONOx - $48,663/ton NOx; CatOx - $3,550/ton CO
Crossroads Energy Center	MS	06/24/2002	580	2	2	GE 7FA (170 MW)	NG	CC	8,760	10.4 ppm	GCP		SCONOx - $23,400/ton NOx; CatOx - $11,039/ton CO
Choctaw Gas Generation, LLC	MS	12/13/2001	700	2	2	SW 501G (250 MW)	NG	CC	8,760	23 ppm	GCP		
LSP Energy (Granite Power)	MS	11/13/2001	300	1	1	SW 501F (230 MW)	NG	CC	8,760	25 ppm	GCP	3-hr	
South Mississippi Electric Power Association	MS	05/29/2002	250	3	0	GE 7EA (83.5 MW)	NG	SC	8,760	25 ppm	GCP	3-hr	
South Mississippi Electric Power Assn.	MS	draft	84	1	0	GE 7EA (83.5 MW)	NG	SC	5,500	20 ppm	GCP	3-hr	Hot SCR - $9,973/ton NOx; CatOx - $2,417/ton CO
Carolina Power & Light, Richmond Co. (2nd revision - new configuration)	NC	applic. under review	2,040	9	0	GE 7FA (170 MW)	NG; FO	CC/SC	8,760/2,000; 1,000 FO	9 ppm NG; 20 ppm FO	GCP		Reconfiguration of facility: 6 CC and 3 SC CTs
Carolina Power & Light, Rowan Co. (revision)	NC	draft permit	1,110	2	0	GE 7FA (170 MW)	NG; FO	CC	8,760; 1,000 FO	15 ppm NG; 20 ppm FO	GCP		Modification of previous permit to switch 2 SC -> CC
Fayetteville Generation	NC	01/10/2002	500	2	0	GE 7FA (170 MW)	NG; FO	CC/SC	8,760; 1000 FO	9 ppm NG; 20-41 ppm FO	GCP		CO level for FO depends on Load
Duke Energy - Buck Steam Station	NC	11/20/2001	640	8	0	GE 7EA (80 MW)	NG; FO	SC	3,000; 1000 FO	20 ppm NG; 25 ppm FO	GCP	3-hr	CatOx - $11,976/ton CO
Entergy Power - Rowan Generating Facility	NC	01/25/2002	930	6	0	GE 7FA (155 MW)	NG; FO	SC	4,400; 1,000 FO	9 ppm NG; 20 ppm FO	GCP		Hot SCR - $13,049/ton NOx; CatOx - $8,204/ton CO
GenPower Earleys, LLC	NC	01/14/2002	528	2	2	GE 7FA (170 MW)	NG	CC	8,760	9 ppm (14 ppm w/DB)	GCP		CO Limit depends on CT model; NOx limit depends on operating history and 3.3 ppm trigger level SCONOx - $21,942/ton NOx; CatOx - $3,246ton CO
Mirant Gastonia	NC	05/28/2002	1,200	4	4	"F" Class (175 MW)	NG	CC	8,760	15 or 30 ppm	GCP	24-hr block	CO Limit depends on CT model; NOx limit depends on operating history and 3.3 ppm trigger level
Carolina Plant	NC	applic. under review	1,300	4	4	GE or SW (170 MW)	NG; FO	CC	8,760	47 or 50 ppm	GCP	24-hr block	CO Limit depends on CT model; NOx limit depends on operating history and 3.3 ppm trigger level
Mountain Creek - Granville Energy Center	NC	applic. under review	911	3	3	GE 7FA (170 MW)	NG	CC	8,760	9 ppm (24.3 ppm w/DB)	GCP		SCONOx - $22,600/ton NOx; CatOx - $3,560ton CO
Dominion Person, Inc.	NC	applic. under review	1,100	4	4	GE 7FA (172 MW)	NG; FO	CC	8,760; 500 FO	9 ppm NG (20 ppm w/DB) 20 ppm FO	GCP		
Forsyth Energy Projects	NC	01/23/2004	812	3	3	GE 7FA (170 MW)	NG; FO	CC	8,760; 1200 FO	11.6 ppm NG (25.9 ppm w/DB); 15.7 ppm FO (25.1 ppm w/DB)	GCP	3-hr	CO Limit depends on CT model; NOx limit depends on operating history and 3.3/17 ppm trigger levels
Columbia Energy	SC	4-01	515	2	2	GE 7FA (170 MW)	NG, FO	CC	8,760; 1,000 FO	17.4 ppm NG; 37 pm FC	GCP		SCONOx - no analysis; CatOx - $1,611/ton CO
GenPower Anderson	SC	07/03/2001	640	2	2	GE 7FA (170 MW)	NG	CC	8,760	11.7 ppm	GCP		
Duke Power - Mill Creek (f/k/a/ RIPP)	SC	11/08/2001	654	8	0	GE 7EA (80 MW)	NG, FO	SC	2,400; 1,000 FO	25 ppm NG; 20 ppm FO	GCP	24-hr	
Greenville Generating	SC	draft prmit	930	6	0	GE 7FA (155 MW)	NG, FO	SC	3,400; 1,000 FO	9 ppm NG; 36 ppm FO	GCP		Hot SCR - $13,909/ton NOx; CatOx - $8,204/ton CO
Greenville Power Project	SC	applic. under review	810	3	3	GE 7FA (170 MW)	NG, FO	CC	8,760; 720 FO	12.3 ppm NG; 16.5 ppm FO	GCP		SCONOx - $18,300/ton NOx; CatOx - $5,800/ton CO; DB < 5,120 hr/yr
Jasper County Generating Facility	SC	05/28/2002	1,260	4	4	GE 7FA (170 MW)	NG, FO	CC	8,760; 720 FO	9 ppm NG (14 ppm w/DB); 20 ppm FO (22 ppm w/DB)	GCP		SCONOx - $19,870/ton NOx; CatOx - $3,320/ton CO
Cherokee Falls Combined-Cycle Facility	SC	applic. under review	1,260	4	4	GE 7FA (173 MW)	NG, FO	CC	8,760; 720 FO	0.063 lb/mmbtu NG; 0.069 lb/mmbtu FO	GCP		SCONOx - $22,434/ton NOx; CatOx - $2,500/ton CO
Fork Shoals Energy, LLC	SC	applic. under review	1,150	2	2	"F" Class (175 MW)	NG	CC	8,760	14 ppm (GE7FA/16 ppm (SW501F)	GCP	24-hr	
Broad River Energy Center (f/k/a Cherokee Falls)	SC	05/22/2003	340	2	0	GE 7FA (170 MW)	NG, FO	SC	3,000	9 ppm (15 ppm w/PA); 20 ppm FO	GCP		Hot SCR - $22,800/ton NOx; CatOx - $10,500/ton CO

Table B-2. Summary of BACT Determinations for CO for Combined Cycle CTs, 2001-2006

Facility	State	Final Permit Issued	# of New MW	# of CTs	# of DB	Turbine Model	Fuel	Mode	Hours	CO Limit	Control Method	Avg. Time	Comments
GenPower Anderson - revision	SC	applic. under review	340	2	0	GE 7FA (170 MW)	NG	SC	2,928	9 ppm**	GCP		Temporary 4 month operating period - **Not Subject to PSD Review for CO, VOC or SO2
Palmetto Energy Center	SC	applic. under review	970	3	3	GE 7FB (180 MW)	NG	CC	8,760	15 ppm (31 ppm w/DB)	GCP		SCONOx - $18,789/ton NOx; CatOx - $2,111/ton CO
Santee Cooper Rainey Generating Station	SC	05/08/2003	251	3	0	GE 7EA (83.5 MW)	NG	SC	8,760	25 ppm	GCP		Hot SCR - $15,550/ton NOx; CatOx - $1,717/ton CO
TVA, Johnsonville Fossil Plant	TN	7-99	340	4	0	GE 7EA (85 MW)	NG; FO	SC	see comment	25 ppm NG; 20 ppm FO	GCP		10% NG base mode, 10% NG peaking, 10% FO base
Memphis Generation LLC	TN	04/09/2001	1,050	4	0	GE 7FA (170 MW)	NG	CC	8,760	0.03 lb/mmBtu	GCP		Phase I - 1 CT (up to 7% total plant heat input from refinery fuel gas), Phase II - 3 CTs (up to 2% total plant heat input from refinery fuel gas)
Haywood Energy Center (Calpine)	TN	02/01/2002	900	3	3	SW, GE 7FA or GE F7B	NG; FO	CC	8,760	varies from 7.4 to 50 ppm depending on CT type and load	GCP		
TVA - Franklin	TN	draft permit	610	2	2	GE 7FA (195 MW)	NG	CC	8,760	25 ppm	GCP		
Southern Power Co.	TN	applic. under review	1,940	8	4	GE 7FA (170 MW)	NG; FO	CC/SC	8760; 1,000 FO	0.035 lb/mmbtu NG; 0.069 lb/mmbtu FO	GCP		

Abbreviations:
GE = General Electric
SW = Seimens Westinghouse
NG = Nat. Gas
FO = Fuel Oil
DB = Duct Burner
SC = Simple Cycle
CC = Combined Cycle
DLN = Dry-Low NOx
WI = Water Injection
SCR = Selective Catalytic Reduction
CatOx = Catalytic Oxidation
GCP = Good Combustion Practices

Source: http://www.epa.gov/region4/air/permits/national_ct_list.xls (2006).

Table B-3. Direct and Indirect Capital Costs for CO Catalyst, Combined- or Simple- Cycle Frame F Combustion Turbine

Cost Component	Costs	Basis of Cost Component
Direct Capital Costs		
CO Associated Equipment	$710,839	Vendor Quote
Flue Gas Ductwork	$44,505	Vatavauk,1990
Instrumentation	$71,084	10% of SCR Associated Equipment
Sales Tax	$42,650	6% of SCR Associated Equipment/Catalyst
Freight	$35,542	5% of SCR Associated Equipment/Catalyst
Total Direct Capital Costs (TDCC)	$904,621	
Direct Installation Costs		
Foundation and supports	$72,370	8% of TDCC and RCC;OAQPS Cost Control Manual
Handling & Erection	$126,647	14% of TDCC and RCC;OAQPS Cost Control Manual
Electrical	$36,185	4% of TDCC and RCC;OAQPS Cost Control Manual
Piping	$18,092	2% of TDCC and RCC;OAQPS Cost Control Manual
Insulation for ductwork	$9,046	1% of TDCC and RCC;OAQPS Cost Control Manual
Painting	$9,046	1% of TDCC and RCC;OAQPS Cost Control Manual
Site Preparation	$5,000	Engineering Estimate
Buildings	$0	
Total Direct Installation Costs (TDIC)	$276,386	
Total Capital Costs	$1,181,007	Sum of TDCC, TDIC and RCC
Indirect Costs		
Engineering	$118,101	10% of Total Capital Costs; OAQPS Cost Control Manual
Construction and Field Expense	$59,050	5% of Total Capital Costs; OAQPS Cost Control Manual
Contractor Fees	$118,101	10% of Total Capital Costs; OAQPS Cost Control Manual
Start-up	$23,620	2% of Total Capital Costs; OAQPS Cost Control Manual
Performance Tests	$11,810	1% of Total Capital Costs; OAQPS Cost Control Manual
Contingencies	$35,430	3% of Total Capital Costs; OAQPS Cost Control Manual
Total Indirect Capital Cost (TInDC)	$366,112	
Total Direct, Indirect and Capital Costs (TDICC)	$1,547,119	Sum of TCC and TInCC

Table B-4. Annualized Cost for CO Catalyst Frame F Combined- of Simple- Cycle Combustion Turbine

Cost Component	Cost	Basis of Cost Estimate	
Diirect Annual Costs			
Operating Personnel	$6,240	8 hours/week at $15/hr	
Supervision	$936	15% of Operating Personnel;OAQPS Cost Control Manual	
Catalyst Replacement	$210,619	3 year catalyst life; base on Vendor Budget Quote	
Inventory Cost	$24,668	Capital Recovery (10.98%) for 1/3 catalyst	
Contingency	$7,274	3% of Direct Annual Costs	
Total Direct Annual Costs (TDAC)	$249,737		
Energy Costs			
Heat Rate Penalty	$238,532	0.2% of MW output; EPA, 1993 (Page 6-20) and $3/mmBtu addl fuel costs	
Total Energy Costs (TDEC)	$238,532		
Indirect Annual Costs			
Overhead	$4,306	60% of Operating/Supervision Labor	
Property Taxes	$15,471	1% of Total Capital Costs	
Insurance	$15,471	1% of Total Capital Costs	
Annualized Total Direct Capital	$169,874	10.98% Capital Recovery Factor of 7% over 15 yrs times sum of TDICC	
Total Indirect Annual Costs	$205,122		
Total Annualized Costs	$693,391	Sum of TDAC, TEC and TIAC	
Cost Effectiveness	$4,772	per ton of CO Removed	145.30 tons/year CO Emissions Removed
	$4,905	per ton of Net Emission Reduction	

Table B-5. Maximum Potential Incremental Emissions (TPY) with Oxidation Catalyst:Frame F CT

		Incremental Emissions (tons/year) of SCR		
Pollutants		Primary	Secondary	Total
Particulate			0.13	0.13
Sulfur Dioxide			0.05	0.05
Nitrogen Oxides			2.30	2.30
Carbon Monoxide		-145.3	1.38	-143.9
Volatile Organic Compounds			0.09	0.09
	Total:	-145.3	3.95	-141.4
Carbon Dioxide (additional from gas firing)			2,188.1	2,188.1

Basis:

Lost Energy (mmBtu/year)	34,549

Secondary Emissions (lb/mmBtu): Assumes natural gas firing in NOx controlled steam unit.

Particulate	0.0072
Sulfur Dioxide	0.0027
Nitrogen Oxides w/LNB	0.1333
Carbon Monoxide	0.0800
Volatile Organic Compounds	0.0052

Reference: Table 1.4-1 and 1.4-2, AP-42, Version 2/98

Table B-6. Comparison of Alternative BACT Control Technologies with Installing OC in HRSG: Frame F CT

	Alternative BACT Control Technologies	
	DLN Only	DLN with OC
Technical Assessment	Feasible	Available, Feasible and Demonstrated
Economic Impact [a]		
Capital Costs	included	$1,547,119
Annualized Costs	included	$693,391
Cost Effectiveness		
CO Removed (per ton of CO)	NA	$4,772
Environmental Impact [b]		
Total CO (TPY)	181	35
CO Reduction (TPY)	NA	-144
Net Pollutant Reduction	NA	-141
Additional Greenhouse Gas (CO2; tons/yr)	--	2,188
Energy Impacts [c]		
Energy Use (kWh/yr)	0	3,372,092
Energy Use (Equivalent Residential Customers/year)	0	281
Energy Use (mmBtu/yr) at 10,000 Btu/kWh	0	34,549
Energy Use (mmcf/yr) at 1,000 Btu/cf for natural gas	0	35

[a] See Tables B-2 and B-3 for detailed development of capital costs (including recurring costs) and annualized costs.

[b] See emission data presented in Table B-4.

[c] Energy impacts are estimated due to the lost energy from heat rate penalty for 8,760 hours per year. Lost energy is based on 0.2 percent of 192 MW.

APPENDIX C

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

CALPUFF MODEL DESCRIPTION AND METHODOLOGY

C.1 INTRODUCTION

As part of the new source review requirements under Prevention of Significant Deterioration (PSD) regulations, new sources are required to address air quality impacts at PSD Class I areas. As part of the PSD analysis report submitted to the Florida Department of Environmental Protection (DEP), the air quality impacts due to the potential emissions of the Bartow Re-powering Project are required to be addressed at the PSD Class I area of the Chassahowitzka National Wildlife Area (NWA). The Chassahowitzka NWA is located approximately 83 km north of the Bartow facility and is the only PSD Class I area located within 200 km of the site.

Because the propose project's SO_2, NO_X and PM_{10} emissions are not subject to PSD review, the evaluation of air quality impacts for this project address only maximum CO pollutant concentrations at the Chassahowitzka NWA.

Currently there are several air quality modeling approaches recommended by the Interagency Workgroup on Air Quality Models (IWAQM) to perform these analyses. The IWAQM consists of EPA and Federal Land Managers (FLM) of Class I areas who are responsible for ensuring that AQRVs are not adversely impacted by new and existing sources. These recommendations have been summarized in two documents:

- *Interagency Workgroup on Air Quality Models (IWAQM), Phase 2 Summary Report and Recommendations for Modeling Long Range Transport Impacts* (EPA, 1998), referred to as the IWAQM Phase 2 report.
- *Federal Land Managers' Air Quality Related Values Workgroup (FLAG), Phase I Report,* USFS, NPS, USFWS (12/00), referred to as the FLAG document.

For the proposed project, air quality analyses were performed that assess the facility's impacts in the PSD Class I area of the Chassahowitzka NWA using the refined modeling approach from the IWAQM Phase 2 report for:

- CO pollutant concentrations

The refined analysis approach was used instead of the screening analysis approach since the air quality impacts are based on generally more realistic assumptions, include more detailed meteorological data, and are estimated at locations at the Class I area.

C.2 GENERAL AIR MODELING APPROACH

The general modeling approach was based on using the long-range transport model, California Puff model [CALPUFF, Version 5.754 ("BART" Version)]. At distances beyond 50 km, the AERMOD model is considered to overpredict air quality impacts, because it is a steady-state model. At those distances, the CALPUFF model is recommended for use. The FLM have requested that air quality impacts, such as for regional haze, for a source located more than 50 km from a Class I area be predicted using the CALPUFF model. The Florida DEP has also recommended that the CALPUFF model be used to assess if the source has a significant impact at a Class I area located beyond 50 km from the source. As a result, a significant impact and regional haze analyses were performed using the CALPUFF model to assess the facility's impacts at the Chassahowitzka NWA.

The methods and assumptions used in the CALPUFF model were based on the latest recommendations for a refined analysis as presented in the IWAQM Phase 2 Summary Report and the FLAG documents.

C.3 MODEL SELECTION AND SETTINGS

The CALPUFF air modeling system was used to model to assess the proposed project's impacts at the PSD Class I area for comparison to the PSD Class I significant impact levels and to the regional haze visibility criteria. 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. CALPUFF was used in a manner that is recommended by the IWAQM Phase 2 and FLAG reports.

C.3.1 CALPUFF MODEL APPROACHES AND SETTINGS

The IWAQM has recommended approaches for performing a Phase 2 refined modeling analyses that are presented in Table C-1. These approaches involve use of meteorological data, selection of receptors and dispersion conditions, and processing of model output.

The specific settings used in the CALPUFF model are presented in Table C-2.

C.3.2 EMISSION INVENTORY AND BUILDING WAKE EFFECTS

The CALPUFF model included the facility's emission, stack, and operating data as well as 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 (BPIP), Version 04274, and were included in the CALPUFF model input. The PSD report presents a listing of the facility's emissions and structures included in the analysis.

C.4 RECEPTOR LOCATIONS

For the refined analyses, pollutant concentrations were predicted in an array of 113 discrete receptors located at the Chassahowitzka NWA area. These receptors were developed by the National Park Service and cover all areas along the boundary and internal areas of the area.

C.5 METEOROLOGICAL DATA

C.5.1 CALMET DOMAINS

The air modeling analysis used CALMET-developed domains that were prepared for Best Available Retrofit Technology applications. The data were obtained from the FEDP for the years 2001 to 2003. The data consists of a 3-dimensional gridded domain of 4-km cell resolution.

Table C-1. Refined Modeling Analyses Recommendations [a]

Model Input/Output	Description
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 sources being modeled; terrain elevation and land-use data is resolved for the situation.
Receptors	Within Class I area(s) of concern; obtain regulatory concurrence on coverage.
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	1. For PSD increments: use highest, second highest 3-hour and 24-hour average SO_2 concentrations; highest, second highest 24-hour average PM_{10} concentrations; and highest annual average SO_2, PM_{10} and NO_x concentrations. 2. For haze: process, on a 24-hour basis, compute the source extinction from the maximum increase in emissions of SO_2, NO_x and PM_{10}; compute the daily relative humidity factor [f(RH)], provided from an external disk file; and compute the maximum percent change in extinction using the FLM supplied background extinction data in the FLAG document. 3. For significant impact analysis: use highest annual and highest short-term averaging time concentrations for SO_2, PM_{10} and NO_x,

[a] IWAQM Phase II report (December, 1998) and FLAG document (December, 2000)

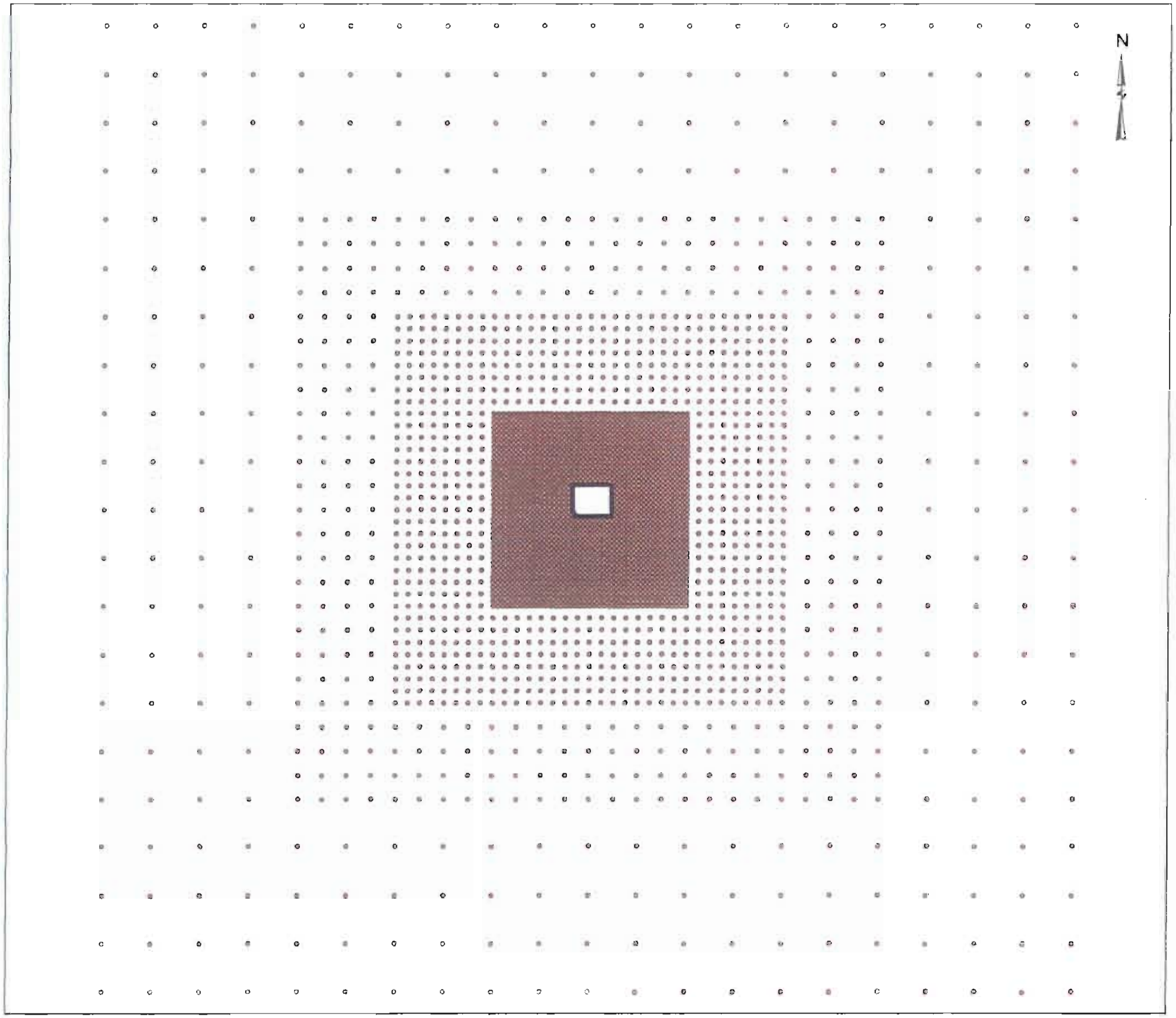
Table C-2. CALPUFF Model Settings

Parameter	Setting
Pollutant Species	SO_2, SO_4, NO_x, HNO_3, NO_3, PM_{10}, CO
Chemical Transformation	MESOPUFF II scheme, hourly ozone data from FDEP
Deposition	Include both dry and wet deposition, plume depletion
Meteorological/Land Use Input	CALMET
Plume Rise	Transitional, Stack-tip downwash, Partial plume penetration
Dispersion	Puff plume element, PG /MP coefficients, rural mode, ISC building downwash scheme
Terrain Effects	Partial plume path adjustment
Output	Create binary concentration file including output species for SO_4, NO_3, PM_{10}, SO_2, and NO_x; process for visibility change using Method 2 and FLAG background extinctions
Model Processing	For haze: highest predicted 24-hour extinction change (%) for the year For deposition: annual average deposition rates For significant impact analysis: highest predicted annual and highest short-term averaging time concentrations for SO_2, NO_x, and PM_{10}, CO
Background Values	Ozone: houly concentration file; Ammonia: 0.5 ppb

[a] Recommended values by the Florida DEP.

APPENDIX D

RECEPTOR LOCATION FIGURES AND BUILDING PROFILE INPUT PROGRAM (BPIP) FILES



LEGEND

Fenceline Receptors - 50 m Spacing

Receptor Grid - 100 m Spacing Fence to 2000 m

Receptor Grid - 250 m Spacing 2000 m to 4000 m

Receptor Grid - 500 m Spacing 4000 m to 6000 m

Receptor Grid - 1000 m Spacing 6000 m to 10000 m

REFERENCE

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17

2,000 0 2,000 Meters

PROJECT

Bartow Repowering Project

TITLE

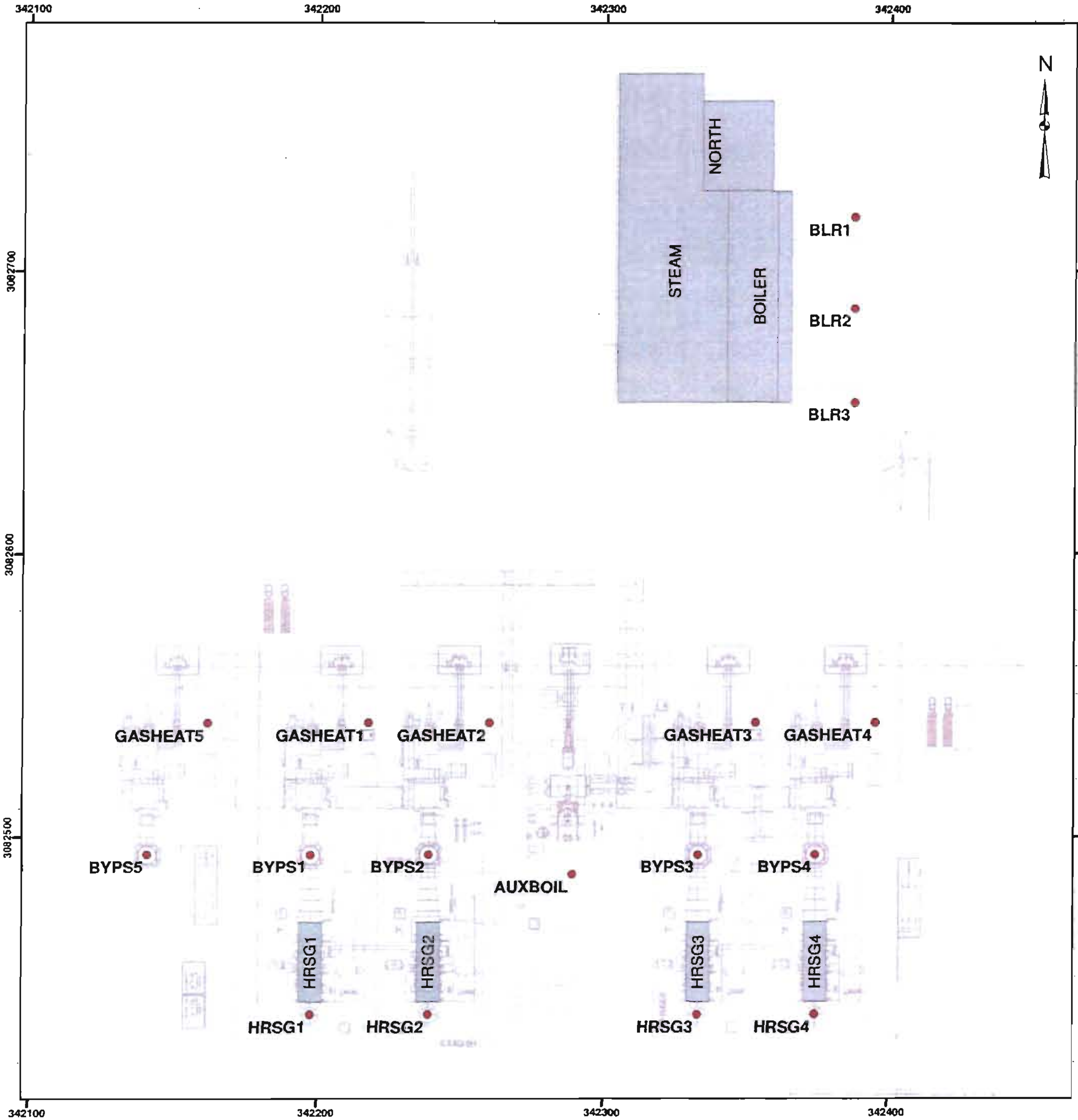
FENCELINE AND RECEPTOR GRID

Golder Associates
Gainesville, Florida

PROJECT No. 063-9519		
DESIGN	AB	24 May 2006
GIS	AB	24 May 2006
CHECK	SM	24 May 2006
REVIEW	SM	24 May 2006

SCALE AS SHOWN REV. 0

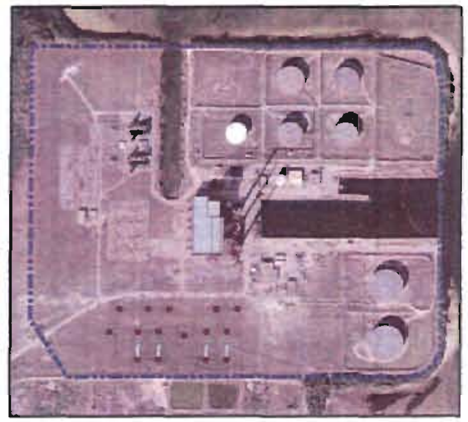
FIGURE D-1



LEGEND

- Point Sources
- Buildings Used in Downwash
- Boundary

REFERENCE



REFERENCE

Projection: Transverse Mercator Datum: NAD 27 Coordinate System: UTM Zone 17

50 0 50 Meters

PROJECT

Progress Energy Bartow Power Plant

TITLE

SOURCE, BUILDING AND PROPERTY BOUNDARY LOCATIONS

PROJECT No 063-9519			SCALE AS SHOWN	REV 0
DESIGN	AB	24 May 2006		
GIS	AB	24 May 2006		

Golder Associates
Gainesville, Florida

FIGURE D-2

```
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'UTMY' 0.0000
7
'HRSG1' 1 0.790
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      342193.616 3082469.557
      342201.552 3082469.557
      342201.552 3082441.336
'HRSG2' 1 0.620
  4 24.400
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      342234.750 3082469.557
      342242.685 3082469.557
      342242.685 3082441.336
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      342329.336 3082469.557
      342337.271 3082469.557
      342337.271 3082441.336
'HRSG4' 1 0.530
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      342370.436 3082469.557
      342378.371 3082469.557
      342378.371 3082441.336
'BOILER' 2 0.340 'Boiler Building'
  4 22.860
      342342.540 3082653.580
      342342.540 3082728.260
      342365.100 3082728.260
      342365.100 3082653.580
  4 39.620
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      342342.540 3082728.280
      342360.220 3082728.280
      342360.220 3082653.600
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      342342.540 3082653.580
      342342.540 3082728.260
      342333.700 3082728.300
      342333.700 3082769.400
      342304.090 3082769.400
'NORTH' 1 0.300 'North of Boiler Building'
  4 46.900
      342333.700 3082728.260
      342333.700 3082759.650
      342358.390 3082759.650
      342358.390 3082728.260
18
'HRSG1'     0.000   36.576   342197.530   3082436.900 'HRSG Unit 1'
'HRSG2'     0.000   36.576   342238.650   3082436.920 'HRSG Unit 2'
'HRSG3'     0.000   36.576   342333.150   3082436.920 'HRSG Unit 3'
'HRSG4'     0.000   36.576   342374.290   3082436.940 'HRSG Unit 4'
'BLR1'      0.000   91.440   342387.400   3082718.970
'BLR2'      0.000   91.440   342387.400   3082686.580
'BLR3'      0.000   91.440   342387.400   3082653.580
'BYPS1'     0.000   36.576   342197.540   3082493.580
'BYPS2'     0.000   36.576   342238.670   3082493.580
'BYPS3'     0.000   36.576   342333.160   3082493.580
'BYPS4'     0.000   36.576   342374.300   3082493.580
'BYPS5'     0.000   36.576   342140.890   3082493.580
'GASHEAT1'  0.000   18.288   342217.500   3082540.000 'natural gas fuel heater'
'GASHEAT5'  0.000   18.288   342161.790   3082540.000 'natural gas fuel heater'
'GASHEAT2'  0.000   18.288   342259.810   3082540.000 'natural gas fuel heater'
'GASHEAT3'  0.000   18.288   342353.350   3082540.000 'natural gas fuel heater'
'GASHEAT4'  0.000   18.288   342395.440   3082540.000 'natural gas fuel heater'
'AUXBOIL'   0.000   18.288   342289.000   3082486.340
```

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BPIP (Dated: 04274)
DATE : 7/21/2006
TIME : 17:46:11
W:\Projects\progress\bartow repowering Jul05\ClassII\PROGBART.isc

============================
BPIP PROCESSING INFORMATION:
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The P flag has been set for preparing downwash related data for a model run utilizing the PRIME algorithm.

Inputs entered in METERS will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

The UTMP variable is set to UTMY. The input is assumed to be in UTM coordinates. BPIP will move the UTM origin to the first pair of UTM coordinates read. The UTM coordinates of the new origin will be subtracted from all the other UTM coordinates entered to form this new local coordinate system.

Plant north is set to 0.00 degrees with respect to True North.

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PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
HRSG1	36.58	-0.79	61.79	65.00
HRSG2	36.58	-0.79	61.79	65.00
HRSG3	36.58	-0.62	61.62	65.00
HRSG4	36.58	-0.61	61.61	65.00
BLR1	91.44	-0.30	107.10	107.10
BLR2	91.44	-0.30	107.10	107.10
BLR3	91.44	-0.30	104.69	104.69
BYPS1	36.58	-0.62	61.62	65.00
BYPS2	36.58	-0.34	99.39	99.39
BYPS3	36.58	-0.34	99.39	99.39
BYPS4	36.58	-0.34	93.65	93.65
BYPS5	36.58	-0.79	61.79	65.00
GASHEAT1	18.29	-0.34	99.39	99.39
GASHEAT5	18.29	-0.62	61.62	65.00
GASHEAT2	18.29	-0.34	99.39	99.39
GASHEAT3	18.29	-0.34	88.69	88.69
GASHEAT4	18.29	-0.34	99.39	99.39
AUXBOIL	18.29	-0.34	99.39	99.39

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.
** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

BPIP (Dated: 04274)
DATE : 7/21/2006
TIME : 17:46:11

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BPIP output is in meters

```
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG1    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID HRSG1    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG1    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG1    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDWID HRSG1    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG1    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG1    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN HRSG1    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG1    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN HRSG1    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN HRSG1    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG1    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN HRSG1    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    HRSG1    3.69   2.83   1.88   0.88  -0.15  -1.17
SO XBADJ    HRSG1   -2.16  -3.08  -3.91  -9.53 -14.85 -19.72
SO XBADJ    HRSG1  -23.99 -27.53 -30.24 -32.03 -32.84 -32.66
SO XBADJ    HRSG1  -32.86 -32.06 -30.29 -27.60 -24.07 -19.81
SO XBADJ    HRSG1  -14.95  -9.63  -4.02  -3.19  -2.26  -1.27
SO XBADJ    HRSG1   -0.23   0.81   1.83   2.79   3.67   4.44
SO YBADJ    HRSG1    3.17   6.29   9.23  11.88  14.17  16.03
SO YBADJ    HRSG1   17.41  18.26  18.55  18.27  17.45  16.09
SO YBADJ    HRSG1   14.24  11.96   9.32   6.39   3.27   0.05
SO YBADJ    HRSG1   -3.17  -6.29  -9.23 -11.88 -14.17 -16.03
SO YBADJ    HRSG1  -17.41 -18.26 -18.55 -18.27 -17.45 -16.09
SO YBADJ    HRSG1  -14.24 -11.96  -9.32  -6.39  -3.27  -0.05

SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG2    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID HRSG2    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG2    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG2    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID HRSG2    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG2    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG2    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN HRSG2    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG2    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN HRSG2    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN HRSG2    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG2    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN HRSG2    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    HRSG2    3.67   2.82   1.87   0.88  -0.15  -1.17
SO XBADJ    HRSG2   -2.15 -43.58 -45.03 -50.02 -53.48 -55.32
SO XBADJ    HRSG2  -55.48 -53.95 -30.21 -32.00 -32.82 -32.64
SO XBADJ    HRSG2  -32.84 -32.05 -30.28 -27.60 -24.07 -19.81
SO XBADJ    HRSG2  -14.95  30.87  37.10  37.30  36.37  34.34
SO XBADJ    HRSG2   31.26  27.23   1.81   2.77   3.65   4.42
SO YBADJ    HRSG2    3.15   6.27   9.20  11.86  14.15  16.01
SO YBADJ    HRSG2   17.39  25.38  18.53  11.11   3.36  -4.49
SO YBADJ    HRSG2  -12.20 -19.55   9.32   6.40   3.28   0.07
SO YBADJ    HRSG2   -3.15  -6.27  -9.20 -11.86 -14.15 -16.01
SO YBADJ    HRSG2  -17.39 -25.38 -18.53 -11.11  -3.36   4.49
SO YBADJ    HRSG2   12.20  19.55  -9.32  -6.40  -3.28  -0.07

SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG3    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID HRSG3    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG3    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG3    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID HRSG3    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG3    29.23  29.17  28.22  29.17  29.23  28.41
```

```
SO BUILDWID HRSG3    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN HRSG3    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG3    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN HRSG3    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN HRSG3    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG3    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN HRSG3    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    HRSG3     3.69   2.85   1.92   0.93  -0.08  -1.10
SO XBADJ    HRSG3    -2.07  -2.99 -98.40 -102.57 -103.63 -19.62
SO XBADJ    HRSG3   -23.90 -27.45 -30.17 -31.97 -32.80 -32.64
SO XBADJ    HRSG3   -32.86 -32.08 -30.32 -27.65 -24.14 -19.89
SO XBADJ    HRSG3   -15.03  -9.73  -4.12  -3.29  -2.36  -1.36
SO XBADJ    HRSG3    -0.32   0.73   1.76   2.74   3.63   4.42
SO YBADJ    HRSG3     3.07   6.19   9.13  11.79  14.09  15.97
SO YBADJ    HRSG3    17.36  18.22  18.53   1.85 -14.89  16.12
SO YBADJ    HRSG3    14.29  12.03   9.40   6.48   3.37   0.15
SO YBADJ    HRSG3    -3.07  -6.19  -9.13 -11.79 -14.09 -15.97
SO YBADJ    HRSG3   -17.36 -18.22 -18.53 -18.27 -17.46 -16.12
SO YBADJ    HRSG3   -14.29 -12.03  -9.40  -6.48  -3.37  -0.15


SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT HRSG4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID HRSG4    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG4    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG4    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID HRSG4    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID HRSG4    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID HRSG4    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN HRSG4    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG4    17.11  12.71   7.93  12.71  17.11  20.98
SO BUILDLEN HRSG4    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN HRSG4    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN HRSG4    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN HRSG4    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    HRSG4     3.66   2.81   1.88   0.89  -0.13  -1.14
SO XBADJ    HRSG4    -2.12 -43.51 -44.95 -49.93 -53.40 -55.24
SO XBADJ    HRSG4   -55.40 -53.88 -30.17 -31.97 -32.79 -32.62
SO XBADJ    HRSG4   -32.83 -32.05 -30.29 -27.61 -24.09 -19.84
SO XBADJ    HRSG4   -14.99  30.79  37.02  37.22  36.29  34.26
SO XBADJ    HRSG4    31.18  27.16   1.77   2.74   3.62   4.40
SO YBADJ    HRSG4     3.10   6.22   9.15  11.81  14.10  15.97
SO YBADJ    HRSG4    17.35  25.34  18.51  11.11   3.37  -4.47
SO YBADJ    HRSG4   -12.17 -19.50   9.35   6.44   3.33   0.11
SO YBADJ    HRSG4    -3.10  -6.22  -9.15 -11.81 -14.10 -15.97
SO YBADJ    HRSG4   -17.35 -25.34 -18.51 -11.11  -3.37   4.47
SO YBADJ    HRSG4    12.17  19.50  -9.35  -6.44  -3.33  -0.11


SO BUILDHGT BLR1     39.62  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR1     46.90  46.90  39.62  46.90  46.90  46.90
SO BUILDHGT BLR1     46.90  46.90  46.90  39.62   0.00   0.00
SO BUILDHGT BLR1     39.62  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR1     46.90  46.90  39.62  46.90  46.90  46.90
SO BUILDHGT BLR1     46.90  46.90  46.90  39.62   0.00   0.00
SO BUILDWID BLR1     44.53  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR1     37.94  35.20  74.68  35.20  37.94  39.53
SO BUILDWID BLR1     39.92  39.09  37.08  51.17   0.00   0.00
SO BUILDWID BLR1     44.53  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR1     37.94  35.20  74.68  35.20  37.94  39.53
SO BUILDWID BLR1     39.92  39.09  37.08  51.17   0.00   0.00
SO BUILDLEN BLR1    107.19  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR1     33.94  29.77  17.68  29.77  33.94  37.08
SO BUILDLEN BLR1     39.09  39.92  39.53 108.72   0.00   0.00
SO BUILDLEN BLR1    107.19  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR1     33.94  29.77  17.68  29.77  33.94  37.08
SO BUILDLEN BLR1     39.09  39.92  39.53 108.72   0.00   0.00
SO XBADJ    BLR1    -72.17 -76.77 -79.04 -78.91 -76.38 -71.53
SO XBADJ    BLR1    -47.28 -51.27 -44.86 -59.95 -64.37 -66.85
SO XBADJ    BLR1    -67.29 -65.68 -62.08 -56.59   0.00   0.00
SO XBADJ    BLR1    -35.02   0.55   5.53  10.34  14.84  18.88
SO XBADJ    BLR1     13.35  21.51  27.18  30.18  30.44  29.77
SO XBADJ    BLR1     28.19  25.76  22.55 -52.13   0.00   0.00
SO YBADJ    BLR1     37.68  24.26  17.18   9.58   1.68  -6.26
SO YBADJ    BLR1     37.62  31.79 -28.03  17.42   9.33   0.96
```

SO	YBADJ	BLR1	-7.44	-15.62	-23.32	-38.93	0.00	0.00
SO	YBADJ	BLR1	-37.68	-24.26	-17.18	-9.58	-1.68	6.26
SO	YBADJ	BLR1	-37.62	-31.79	28.03	-17.42	-9.33	-0.96
SO	YBADJ	BLR1	7.44	15.62	23.32	38.93	0.00	0.00

SO	BUILDHGT	BLR2	0.00	39.62	39.62	39.62	39.62	39.62
SO	BUILDHGT	BLR2	39.62	39.62	39.62	39.62	39.62	46.90
SO	BUILDHGT	BLR2	46.90	46.90	46.90	39.62	39.62	0.00
SO	BUILDHGT	BLR2	0.00	39.62	39.62	39.62	39.62	39.62
SO	BUILDHGT	BLR2	39.62	39.62	39.62	39.62	39.62	46.90
SO	BUILDHGT	BLR2	46.90	46.90	46.90	39.62	39.62	0.00
SO	BUILDWID	BLR2	0.00	42.16	52.65	61.55	68.57	73.51
SO	BUILDWID	BLR2	76.22	76.62	74.68	76.62	76.22	39.53
SO	BUILDWID	BLR2	39.92	39.09	37.08	42.16	34.02	0.00
SO	BUILDWID	BLR2	0.00	42.16	52.65	61.55	68.57	73.51
SO	BUILDWID	BLR2	76.22	76.62	74.68	76.62	76.22	39.53
SO	BUILDWID	BLR2	39.92	39.09	37.08	42.16	34.02	0.00
SO	BUILDLEN	BLR2	0.00	76.22	73.51	68.57	61.55	52.65
SO	BUILDLEN	BLR2	42.16	30.38	17.68	30.38	42.16	37.08
SO	BUILDLEN	BLR2	39.09	39.92	39.53	76.22	109.04	0.00
SO	BUILDLEN	BLR2	0.00	76.22	73.51	68.57	61.55	52.65
SO	BUILDLEN	BLR2	42.16	30.38	17.68	30.38	42.16	37.08
SO	BUILDLEN	BLR2	39.09	39.92	39.53	76.22	109.04	0.00
SO	XBADJ	BLR2	0.00	-46.33	-50.99	-54.10	-55.56	-55.34
SO	XBADJ	BLR2	-53.43	-49.91	-44.86	-51.42	-56.42	-83.04
SO	XBADJ	BLR2	-88.11	-90.49	-90.13	-54.53	-81.28	0.00
SO	XBADJ	BLR2	0.00	-29.89	-22.52	-14.47	-5.98	2.69
SO	XBADJ	BLR2	11.28	19.53	27.18	21.04	14.26	45.96
SO	XBADJ	BLR2	49.01	50.58	50.60	-21.69	-27.76	0.00
SO	YBADJ	BLR2	0.00	35.34	33.37	30.40	26.49	21.79
SO	YBADJ	BLR2	16.42	10.55	4.36	-1.96	-8.22	29.01
SO	YBADJ	BLR2	17.37	5.20	-7.13	-32.36	-32.89	0.00
SO	YBADJ	BLR2	0.00	-35.34	-33.37	-30.40	-26.49	-21.79
SO	YBADJ	BLR2	-16.42	-10.55	-4.36	1.96	8.22	-29.01
SO	YBADJ	BLR2	-17.37	-5.20	7.13	32.36	32.89	0.00

SO	BUILDHGT	BLR3	0.00	0.00	0.00	0.00	39.62	39.62
SO	BUILDHGT	BLR3	39.62	39.62	39.62	39.62	39.62	39.62
SO	BUILDHGT	BLR3	39.62	46.90	46.90	39.62	46.90	0.00
SO	BUILDHGT	BLR3	0.00	0.00	0.00	0.00	39.62	39.62
SO	BUILDHGT	BLR3	39.62	39.62	39.62	39.62	39.62	39.62
SO	BUILDHGT	BLR3	39.62	46.90	39.62	39.62	39.62	0.00
SO	BUILDWID	BLR3	0.00	0.00	0.00	0.00	68.57	73.51
SO	BUILDWID	BLR3	76.22	76.62	74.68	76.62	76.22	73.51
SO	BUILDWID	BLR3	68.57	38.33	37.08	42.16	29.77	0.00
SO	BUILDWID	BLR3	0.00	0.00	0.00	0.00	68.57	73.51
SO	BUILDWID	BLR3	76.22	76.62	74.68	76.62	76.22	73.51
SO	BUILDWID	BLR3	68.57	38.33	52.65	42.16	34.02	0.00
SO	BUILDLEN	BLR3	0.00	0.00	0.00	0.00	61.55	52.65
SO	BUILDLEN	BLR3	42.16	30.38	17.68	30.38	42.16	52.65
SO	BUILDLEN	BLR3	61.55	39.92	39.53	76.22	35.20	0.00
SO	BUILDLEN	BLR3	0.00	0.00	0.00	0.00	61.55	52.65
SO	BUILDLEN	BLR3	42.16	30.38	17.68	30.38	42.16	52.65
SO	BUILDLEN	BLR3	61.55	39.92	73.51	76.22	109.04	0.00
SO	XBADJ	BLR3	0.00	0.00	0.00	0.00	-34.35	-38.84
SO	XBADJ	BLR3	-42.15	-44.18	-44.86	-57.15	-67.70	-76.20
SO	XBADJ	BLR3	-82.38	-115.77	-118.71	-85.54	-113.78	0.00
SO	XBADJ	BLR3	0.00	0.00	0.00	0.00	-27.20	-13.81
SO	XBADJ	BLR3	-0.01	13.80	27.18	26.77	25.55	23.55
SO	XBADJ	BLR3	20.83	75.86	13.61	9.31	4.74	0.00
SO	YBADJ	BLR3	0.00	0.00	0.00	0.00	51.77	50.36
SO	YBADJ	BLR3	47.43	43.05	37.36	30.54	22.79	14.34
SO	YBADJ	BLR3	5.47	26.41	9.37	-21.07	-25.03	0.00
SO	YBADJ	BLR3	0.00	0.00	0.00	0.00	-51.77	-50.36
SO	YBADJ	BLR3	-47.43	-43.05	-37.36	-30.54	-22.79	-14.34
SO	YBADJ	BLR3	-5.47	-26.41	12.51	21.07	27.16	0.00

SO	BUILDHGT	BYPS1	24.40	24.40	24.40	0.00	0.00	0.00
SO	BUILDHGT	BYPS1	0.00	0.00	0.00	0.00	24.40	24.40
SO	BUILDHGT	BYPS1	24.40	24.40	24.40	24.40	24.40	0.00
SO	BUILDHGT	BYPS1	24.40	24.40	24.40	0.00	0.00	0.00
SO	BUILDHGT	BYPS1	0.00	0.00	0.00	0.00	24.40	24.40
SO	BUILDHGT	BYPS1	24.40	24.40	24.40	24.40	24.40	24.40
SO	BUILDWID	BYPS1	12.72	17.11	20.98	0.00	0.00	0.00
SO	BUILDWID	BYPS1	0.00	0.00	0.00	0.00	29.23	28.41
SO	BUILDWID	BYPS1	26.72	24.22	20.98	17.11	12.72	0.00

```
SO BUILDWID BYPS1     12.72  17.11  20.98   0.00   0.00   0.00
SO BUILDWID BYPS1      0.00   0.00   0.00   0.00  29.23  28.41
SO BUILDWID BYPS1     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN BYPS1     29.17  29.23  28.41   0.00   0.00   0.00
SO BUILDLEN BYPS1      0.00   0.00   0.00   0.00  17.11  20.98
SO BUILDLEN BYPS1     24.22  26.72  28.41  29.23  29.17   0.00
SO BUILDLEN BYPS1     29.17  29.23  28.41   0.00   0.00   0.00
SO BUILDLEN BYPS1      0.00   0.00   0.00   0.00  17.11  20.98
SO BUILDLEN BYPS1     24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    BYPS1    -52.13 -50.44 -47.21   0.00   0.00   0.00
SO XBADJ    BYPS1      0.00   0.00   0.00   0.00  43.18  44.24
SO XBADJ    BYPS1     43.95  42.32  18.84  21.23  22.98   0.00
SO XBADJ    BYPS1     22.96  21.20  18.80   0.00   0.00   0.00
SO XBADJ    BYPS1      0.00   0.00   0.00   0.00 -60.29 -65.22
SO XBADJ    BYPS1    -68.16 -69.04 -47.25 -50.47 -52.15 -52.24
SO YBADJ    BYPS1     -6.67 -13.08 -19.10   0.00   0.00   0.00
SO YBADJ    BYPS1      0.00   0.00   0.00   0.00 -21.75 -12.44
SO YBADJ    BYPS1     -2.74   7.03 -19.03 -13.00  -6.58   0.00
SO YBADJ    BYPS1      6.67  13.08  19.10   0.00   0.00   0.00
SO YBADJ    BYPS1      0.00   0.00   0.00   0.00  21.75  12.44
SO YBADJ    BYPS1      2.74  -7.03  19.03  13.00   6.58  -0.04


SO BUILDHGT BYPS2     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT BYPS2     24.40   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS2      0.00   0.00  24.40  24.40  24.40   0.00
SO BUILDHGT BYPS2     24.40  39.62  39.62  39.62  24.40  24.40
SO BUILDHGT BYPS2     24.40   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT BYPS2      0.00   0.00  24.40  24.40  24.40  24.40
SO BUILDWID BYPS2     12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID BYPS2     29.23   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS2      0.00   0.00  20.98  17.11  12.71   0.00
SO BUILDWID BYPS2     12.71  42.16  52.65  61.55  26.72  28.41
SO BUILDWID BYPS2     29.23   0.00   0.00  29.17  29.23  28.41
SO BUILDWID BYPS2      0.00   0.00  20.98  17.11  12.71   7.94
SO BUILDLEN BYPS2     29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN BYPS2     17.11   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS2      0.00   0.00  28.41  29.23  29.17   0.00
SO BUILDLEN BYPS2     29.17  76.22  73.51  68.57  24.22  20.98
SO BUILDLEN BYPS2     17.11   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN BYPS2      0.00   0.00  28.41  29.23  29.17  28.22
SO XBADJ    BYPS2    -52.13 -50.43 -67.77 -68.98 -68.10 -65.14
SO XBADJ    BYPS2    -60.21   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS2      0.00   0.00  18.84  21.23  22.98   0.00
SO XBADJ    BYPS2     22.96 -262.12 -264.03 -257.92 43.88 44.16
SO XBADJ    BYPS2     43.10   0.00   0.00 -106.18 -110.52 -111.51
SO XBADJ    BYPS2      0.00   0.00 -47.25 -50.47 -52.15 -52.24
SO YBADJ    BYPS2     -6.67 -13.09  16.51   6.96  -2.80 -12.48
SO YBADJ    BYPS2    -21.78   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS2      0.00   0.00 -19.03 -13.00  -6.58   0.00
SO YBADJ    BYPS2      6.67  38.41  -1.07 -40.52   2.80  12.48
SO YBADJ    BYPS2     21.78   0.00   0.00  21.12   3.47 -14.29
SO YBADJ    BYPS2      0.00   0.00  19.03  13.00   6.58  -0.05


SO BUILDHGT BYPS3     24.40  24.40  24.40   0.00   0.00  24.40
SO BUILDHGT BYPS3     24.40  24.40   0.00   0.00  24.40  24.40
SO BUILDHGT BYPS3     24.40  24.40  24.40  24.40  24.40  39.62
SO BUILDHGT BYPS3     39.62  24.40  24.40   0.00   0.00   0.00
SO BUILDHGT BYPS3      0.00   0.00   0.00   0.00  24.40  24.40
SO BUILDHGT BYPS3     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID BYPS3     12.71  17.11  20.98   0.00   0.00  28.41
SO BUILDWID BYPS3     29.23  29.17   0.00   0.00  29.23  28.41
SO BUILDWID BYPS3     26.72  24.22  20.98  17.11  12.71  26.52
SO BUILDWID BYPS3     44.53  17.11  20.98   0.00   0.00   0.00
SO BUILDWID BYPS3      0.00   0.00   0.00   0.00  29.23  28.41
SO BUILDWID BYPS3     26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN BYPS3     29.17  29.23  28.41   0.00   0.00  20.98
SO BUILDLEN BYPS3     17.11  12.71   0.00   0.00  17.11  20.98
SO BUILDLEN BYPS3     24.22  26.72  28.41  29.23  29.17 106.05
SO BUILDLEN BYPS3    107.19  29.23  28.41   0.00   0.00   0.00
SO BUILDLEN BYPS3      0.00   0.00   0.00   0.00  17.11  20.98
SO BUILDLEN BYPS3     24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    BYPS3    -52.11 -50.40 -47.16   0.00   0.00 -111.35
SO XBADJ    BYPS3   -110.34 -105.99  0.00   0.00  43.24  44.29
SO XBADJ    BYPS3     44.00  42.36  18.89  21.27  22.99 -266.07
SO XBADJ    BYPS3   -266.41  21.17  18.75   0.00   0.00   0.00
SO XBADJ    BYPS3      0.00   0.00   0.00   0.00 -60.35 -65.28
SO XBADJ    BYPS3    -68.22 -69.08 -47.30 -50.50 -52.16 -52.24
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SO YBADJ    BYPS3    -6.76 -13.18 -19.19  0.00   0.00  14.20
SO YBADJ    BYPS3    -3.53 -21.15   0.00  0.00 -21.73 -12.40
SO YBADJ    BYPS3    -2.70   7.08 -18.94 -12.91 -6.48  13.80
SO YBADJ    BYPS3   -23.40  13.18  19.19  0.00   0.00   0.00
SO YBADJ    BYPS3     0.00   0.00   0.00  0.00  21.73  12.40
SO YBADJ    BYPS3     2.70  -7.08  18.94 12.91   6.48  -0.14


SO BUILDHGT BYPS4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT BYPS4    24.40   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS4     0.00   0.00  24.40  24.40  39.62   0.00
SO BUILDHGT BYPS4    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT BYPS4    24.40   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS4     0.00   0.00  24.40  24.40  24.40  24.40
SO BUILDWID BYPS4    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID BYPS4    29.23   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS4     0.00   0.00  20.98  17.11  34.02   0.00
SO BUILDWID BYPS4    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID BYPS4    29.23   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS4     0.00   0.00  20.98  17.11  12.71   7.94
SO BUILDLEN BYPS4    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN BYPS4    17.11   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS4     0.00   0.00  28.41  29.23 109.04   0.00
SO BUILDLEN BYPS4    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN BYPS4    17.11   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS4     0.00   0.00  28.41  29.23  29.17  28.22
SO XBADJ    BYPS4   -52.12 -50.41 -67.73 -68.92 -68.03 -65.06
SO XBADJ    BYPS4   -60.12   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS4     0.00   0.00  18.87  21.25 -269.08  0.00
SO XBADJ    BYPS4    22.95  21.18  39.32  42.20  43.81  44.08
SO XBADJ    BYPS4    43.01   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS4     0.00   0.00 -47.28 -50.49 -52.16 -52.24
SO YBADJ    BYPS4    -6.72 -13.14  16.44   6.89  -2.86 -12.53
SO YBADJ    BYPS4   -21.81   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS4     0.00   0.00 -18.98 -12.95  13.52   0.00
SO YBADJ    BYPS4     6.72  13.14 -16.44  -6.89   2.86  12.53
SO YBADJ    BYPS4    21.81   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS4     0.00   0.00  18.98  12.95   6.52  -0.10


SO BUILDHGT BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT BYPS5     0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT BYPS5    24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID BYPS5     0.00   0.00   0.00  29.17  29.23  28.41
SO BUILDWID BYPS5    26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN BYPS5     0.00   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN BYPS5    24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    BYPS5     0.00   0.00   0.00 -109.32 -74.87 -78.66
SO XBADJ    BYPS5   -80.05 -79.01   0.00   0.00   0.00   0.00
SO YBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS5     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    BYPS5     0.00   0.00   0.00  20.57  16.44   4.68
SO YBADJ    BYPS5    -7.23 -18.92   0.00   0.00   0.00   0.00


SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
```

```
SO BUILDWID GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT1  0.00  0.00 52.65 61.55 68.57  0.00
SO BUILDWID GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT1  0.00  0.00  0.00 17.11 12.71  0.00
SO BUILDLEN GASHEAT1 29.17 29.23  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT1  0.00  0.00 73.51 68.57 61.55  0.00
SO BUILDLEN GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT1  0.00  0.00  0.00 29.23 29.17  0.00
SO XBADJ    GASHEAT1 -101.31 -100.88  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT1  0.00  0.00 -234.42 -235.97 -230.35  0.00
SO XBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT1  0.00  0.00  0.00 -101.33 -101.54  0.00
SO YBADJ    GASHEAT1  4.93 -10.20  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT1  0.00  0.00 40.47  5.54 -29.57  0.00
SO YBADJ    GASHEAT1  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT1  0.00  0.00  0.00  8.98 -6.21  0.00


SO BUILDHGT GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT5 24.40 24.40 24.40 24.40  0.00  0.00
SO BUILDWID GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT5 26.72 24.22 20.98 17.11  0.00  0.00
SO BUILDLEN GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT5 24.22 26.72 28.41 29.23  0.00  0.00
SO XBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT5 -125.39 -127.58 -105.33 -106.31  0.00  0.00
SO YBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT5  0.00  0.00  0.00  0.00  0.00  0.00
SO YBADJ    GASHEAT5 15.32 -4.58 11.28 -4.72  0.00  0.00


SO BUILDHGT GASHEAT2 24.40 24.40 24.40 24.40 24.40  0.00
SO BUILDHGT GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT2  0.00 39.62 39.62 39.62  0.00  0.00
SO BUILDHGT GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT GASHEAT2 24.40 24.40  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT2 12.71 17.11 20.98 24.22 26.72  0.00
SO BUILDWID GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT2  0.00 42.16 52.65 61.55  0.00  0.00
SO BUILDWID GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID GASHEAT2 26.72 24.22  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT2 29.17 29.23 28.41 26.72 24.22  0.00
SO BUILDLEN GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT2  0.00 76.22 73.51 68.57  0.00  0.00
SO BUILDLEN GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDLEN GASHEAT2 24.22 26.72  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13  0.00
SO XBADJ    GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT2  0.00  0.00  0.00  0.00  0.00  0.00
SO XBADJ    GASHEAT2  0.00 -211.27 -213.26 -208.77  0.00  0.00
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SO XBADJ    GASHEAT2   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT2 -122.76 -125.37   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT2   6.09   -9.10   11.61   -6.68  -24.77    0.00
SO YBADJ    GASHEAT2   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT2   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT2   0.00   34.42    3.83  -26.88    0.00    0.00
SO YBADJ    GASHEAT2   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT2  17.53   -1.95    0.00    0.00    0.00    0.00


SO BUILDHGT GASHEAT3  24.40   24.40    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT3   0.00    0.00    0.00    0.00   39.62   39.62
SO BUILDHGT GASHEAT3  39.62    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT3   0.00    0.00    0.00   24.40   24.40    0.00
SO BUILDWID GASHEAT3  12.71   17.11    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT3   0.00    0.00    0.00    0.00   32.49   26.52
SO BUILDWID GASHEAT3  32.49    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT3   0.00    0.00    0.00   17.11   12.71    0.00
SO BUILDLEN GASHEAT3  29.17   29.23    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT3   0.00    0.00    0.00    0.00  109.04  106.05
SO BUILDLEN GASHEAT3 107.19    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT3   0.00    0.00    0.00   29.23   29.17    0.00
SO XBADJ    GASHEAT3 -101.34 -100.93   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3   0.00    0.00    0.00    0.00 -219.73 -219.65
SO XBADJ    GASHEAT3 -217.19   0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3   0.00    0.00    0.00 -101.27 -101.51    0.00
SO YBADJ    GASHEAT3   5.06  -10.08    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3   0.00    0.00    0.00    0.00   26.09   -6.39
SO YBADJ    GASHEAT3 -35.23    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3   0.00    0.00    0.00    9.14   -6.05    0.00


SO BUILDHGT GASHEAT4  24.40   24.40   24.40   24.40   24.40    0.00
SO BUILDHGT GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4   0.00    0.00   39.62   39.62   39.62    0.00
SO BUILDHGT GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4  12.71   17.11   20.98   24.22   26.72    0.00
SO BUILDWID GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4   0.00    0.00   52.65   42.16   34.02    0.00
SO BUILDWID GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4  29.17   29.23   28.41   26.72   24.22    0.00
SO BUILDLEN GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4   0.00    0.00   73.51   76.22  109.04    0.00
SO BUILDLEN GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4 -101.51 -101.27 -118.50 -118.07 -114.06   0.00
SO XBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4   0.00    0.00 -189.51 -195.02 -227.03    0.00
SO XBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4   6.03   -9.15   11.54   -6.75  -24.83    0.00
SO YBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4   0.00    0.00   37.31   10.22  -15.36    0.00
SO YBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4   0.00    0.00    0.00    0.00    0.00    0.00


SO BUILDHGT AUXBOIL    0.00    0.00    0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL   24.40   24.40    0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL   24.40   24.40    0.00    0.00    0.00    0.00
SO BUILDHGT AUXBOIL   39.62   39.62    0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL    0.00   24.40    0.00   24.40   24.40   24.40
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SO BUILDHGT AUXBOIL  24.40  24.40  0.00  0.00  0.00  0.00
SO BUILDWID AUXBOIL  0.00  0.00  0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL  29.23  29.17  0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL  26.72  24.22  0.00  0.00  0.00  0.00
SO BUILDWID AUXBOIL  44.53  42.16  0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL  0.00  29.17  0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL  26.72  24.22  0.00  0.00  0.00  0.00
SO BUILDLEN AUXBOIL  0.00  0.00  0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL  17.11  12.72  0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL  24.22  26.72  0.00  0.00  0.00  0.00
SO BUILDLEN AUXBOIL  107.19  76.22  0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL  0.00  12.71  0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL  24.22  26.72  0.00  0.00  0.00  0.00
SO XBADJ    AUXBOIL  0.00  0.00  0.00  -69.35  -70.49  -105.11
SO XBADJ    AUXBOIL  -105.02  -101.75  0.00  42.64  43.64  43.32
SO XBADJ    AUXBOIL  41.69  38.78  0.00  0.00  0.00  0.00
SO XBADJ    AUXBOIL  -281.21  -251.71  0.00  42.63  46.27  48.50
SO XBADJ    AUXBOIL  0.00  48.53  0.00  -55.35  -60.75  -64.31
SO XBADJ    AUXBOIL  -65.91  -65.50  0.00  0.00  0.00  0.00
SO YBADJ    AUXBOIL  0.00  0.00  0.00  18.66  8.66  18.95
SO YBADJ    AUXBOIL  2.24  -14.55  0.00  -22.73  -13.88  -4.60
SO YBADJ    AUXBOIL  4.81  14.08  0.00  0.00  0.00  0.00
SO YBADJ    AUXBOIL  18.83  -11.36  0.00  -18.66  -8.66  1.61
SO YBADJ    AUXBOIL  0.00  21.69  0.00  22.73  13.88  4.60
SO YBADJ    AUXBOIL  -4.81  -14.08  0.00  0.00  0.00  0.00
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APPENDIX E

MODEL SUMMARY AND INPUT FILES

TABLE E-1
MAXIMUM POLLUTANT CONCENTRATIONS PREDICTED FOR ONE COMBUSTION TURBINE FIRING FUEL OIL, SIMPLE CYCLE OPERATION, AND ONE NATURAL GAS-FIRED GAS HEATER

Pollutant	Maximum Emission Rates (lb/hr) by Operating Load and Air Inlet Temperature: 100% Load 35 °F	100% Load 95 °F	80% Load 20 °F	80% Load 105 °F	65% Load 20 °F	65% Load 105 °F	Averaging Time	Maximum Predicted Concentrations (ug/m³) by Operating Load and Air Inlet Temperature [a]: 100% Load 35 °F	100% Load 95 °F	80% Load 20 °F	80% Load 105 °F	65% Load 20 °F	65% Load 105 °F
COMBUSTION TURBINE													
Fuel Oil													
Generic	79.365	79.365	79.365	79.365	79.365	79.365	Annual	0.058	0.062	0.060	0.069	0.063	0.072
(10 g/s)							24-Hour	1.814	1.971	1.901	2.219	2.024	2.311
							8-Hour	3.956	4.247	4.078	4.797	4.334	4.989
							3-Hour	5.435	5.821	5.598	6.376	5.879	6.636
							1-Hour	8.419	9.397	9.001	10.909	9.783	11.398
CO	158.3	146.8	132.3	117.5	110.9	102.7	8-Hour	7.89	7.85	6.80	7.10	6.06	6.46
							1-Hour	16.80	17.38	15.00	16.15	13.67	14.75
SO_2	100.4	89.6	79.9	66.3	67.4	57.5	Annual	0.073	0.070	0.060	0.058	0.054	0.052
							24-Hour	2.295	2.225	1.915	1.854	1.717	1.673
							3-Hour	6.876	6.569	5.638	5.328	4.989	4.805
PM_{10}	60.0	60.0	60.0	60.0	60.0	60.0	Annual	0.044	0.047	0.045	0.052	0.048	0.054
							24-Hour	1.372	1.490	1.437	1.677	1.530	1.747
NO_x/ NO_2	334.0	298.0	270.3	224.0	227.2	194.0	Annual	0.243	0.234	0.204	0.196	0.181	0.176
GAS HEATER	All Temperatures/Loads							All Temperatures/Loads					
Natural Gas													
Generic	79.365						Annual	37.13					
(10 g/s)							24-Hour	216.23					
							8-Hour	357.97					
							3-Hour	582.11					
							1-Hour	819.58					
CO	0.24						8-Hour	1.08					
							1-Hour	2.48					
SO_2	0.016						Annual	0.007					
							24-Hour	0.044					
							3-Hour	0.117					
PM_{10}	0.005						Annual	0.002					
							24-Hour	0.014					
NO_x/ NO_2	0.29						Annual	0.14					

[a] Concentrations are based on highest concentrations predicted using five years of meteorological data from 2001 to 2005 of surface and upper air data from the National Weather Service station at Tampa International Airport.

Pollutant concentrations were based on a modeled or generic concentration predicted using a modeled emission rate of 79.365 lb/hr (10 g/s). Specific pollutant concentrations were estimated by multiplying the modeled concentration (at 0.5 g/s) by the ratio of the specific pollutant emission rate to the modeled emission rate of 10 g/s.

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CO STARTING
  TITLEONE 2001 BARTOW REPOWERING, AERMOD, CO LOAD ANALYSIS, FUEL OIL 7/22/06
  TITLETWO TAMPA/TAMPA 2001-2005
  MODELOPT DFAULT CONC
  AVERTIME 24 8 3 1
  POLLUTID CO
  RUNORNOT RUN
CO FINISHED
**
***************************************
** AERMOD Source Pathway
***************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


  LOCATION OCA1035 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1035 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1035 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1035 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1035 POINT 342140.890 3082493.580 0.000
  LOCATION OCA1095 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1095 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1095 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1095 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1095 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8090 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6090 POINT 342140.890 3082493.580 0.000
  LOCATION GASHEAT1 POINT 342217.500 3082540.000 0.000
  LOCATION GASHEAT5 POINT 342161.790 3082540.000 0.000
  LOCATION GASHEAT2 POINT 342259.810 3082540.000 0.000
  LOCATION GASHEAT3 POINT 342353.350 3082540.000 0.000
  LOCATION GASHEAT4 POINT 342395.440 3082540.000 0.000
  LOCATION  AUXBOIL POINT 342289.000 3082486.340 0.000

** Source Parameters **
  SRCPARAM OCA1035 19.95 36.6 382.0 24.7 5.49
  SRCPARAM OCB1035 19.95 36.6 382.0 24.7 5.49
  SRCPARAM OCC1035 19.95 36.6 382.0 24.7 5.49
  SRCPARAM OCD1035 19.95 36.6 382.0 24.7 5.49
  SRCPARAM OSE1035 19.95 36.6 828.0 35.8 6.71

  SRCPARAM OCA1095 18.49 36.6 382.0 22.4 5.49
  SRCPARAM OCB1095 18.49 36.6 382.0 22.4 5.49
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   SRCPARAM OCC1095 18.49 36.6 382.0 22.4 5.49
   SRCPARAM OCD1095 18.49 36.6 382.0 22.4 5.49
   SRCPARAM OSE1095 18.49 36.6 851.0 33.3 6.71

   SRCPARAM OCA8020 16.67 36.6 382.0 22.0 5.49
   SRCPARAM OCB8020 16.67 36.6 382.0 22.0 5.49
   SRCPARAM OCC8020 16.67 36.6 382.0 22.0 5.49
   SRCPARAM OCD8020 16.67 36.6 382.0 22.0 5.49
   SRCPARAM OSE8020 16.67 36.6 878.0 33.9 6.71

   SRCPARAM OCA8090 14.81 36.6 382.0 18.7 5.49
   SRCPARAM OCB8090 14.81 36.6 382.0 18.7 5.49
   SRCPARAM OCC8090 14.81 36.6 382.0 18.7 5.49
   SRCPARAM OCD8090 14.81 36.6 382.0 18.7 5.49
   SRCPARAM OSE8090 14.81 36.6 905.0 29.7 6.71

   SRCPARAM OCA6020 13.97 36.6 382.0 20.2 5.49
   SRCPARAM OCB6020 13.97 36.6 382.0 20.2 5.49
   SRCPARAM OCC6020 13.97 36.6 382.0 20.2 5.49
   SRCPARAM OCD6020 13.97 36.6 382.0 20.2 5.49
   SRCPARAM OSE6020 13.97 36.6 905.0 32.0 6.71

   SRCPARAM OCA6090 12.94 36.6 382.0 17.7 5.49
   SRCPARAM OCB6090 12.94 36.6 382.0 17.7 5.49
   SRCPARAM OCC6090 12.94 36.6 382.0 17.7 5.49
   SRCPARAM OCD6090 12.94 36.6 382.0 17.7 5.49
   SRCPARAM OSE6090 12.94 36.6 922.0 28.6 6.71

   SRCPARAM GASHEAT1 0.030 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT5 0.030 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT2 0.030 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT3 0.030 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT4 0.030 18.3 533.0  7.92 0.61
   SRCPARAM  AUXBOIL 1.027 18.3 420.0 24.69 0.84
** Building Downwash **
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCA1035-OCA8095    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDWID OCA1035-OCA8095    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN OCA1035-OCA8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCA1035-OCA8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCA1035-OCA8095    3.69  2.83   1.88   0.88  -0.15  -1.17
SO XBADJ    OCA1035-OCA8095    -2.16  -3.08  -3.91  -9.53 -14.85 -19.72
SO XBADJ    OCA1035-OCA8095    -23.99 -27.53 -30.24 -32.03 -32.84 -32.66
SO XBADJ    OCA1035-OCA8095    -32.86 -32.06 -30.29 -27.60 -24.07 -19.81
SO XBADJ    OCA1035-OCA8095    -14.95  -9.63  -4.02  -3.19  -2.26  -1.27
SO XBADJ    OCA1035-OCA8095    -0.23   0.81   1.83   2.79   3.67   4.44
SO YBADJ    OCA1035-OCA8095    3.17   6.29   9.23  11.88  14.17  16.03
SO YBADJ    OCA1035-OCA8095    17.41  18.26  18.55  18.27  17.45  16.09
SO YBADJ    OCA1035-OCA8095    14.24  11.96   9.32   6.39   3.27   0.05
SO YBADJ    OCA1035-OCA8095    -3.17  -6.29  -9.23 -11.88 -14.17 -16.03
SO YBADJ    OCA1035-OCA8095    -17.41 -18.26 -18.55 -18.27 -17.45 -16.09
SO YBADJ    OCA1035-OCA8095    -14.24 -11.96  -9.32  -6.39  -3.27  -0.05


SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095    26.72  24.22  20.98  17.11  12.71   7.94
```

```
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCB1035-OCB8095    3.67   2.82   1.87   0.88  -0.15  -1.17
SO XBADJ    OCB1035-OCB8095   -2.15 -43.58 -45.03 -50.02 -53.48 -55.32
SO XBADJ    OCB1035-OCB8095  -55.48 -53.95 -30.21 -32.00 -32.82 -32.64
SO XBADJ    OCB1035-OCB8095  -32.84 -32.05 -30.28 -27.60 -24.07 -19.81
SO XBADJ    OCB1035-OCB8095  -14.95  30.87  37.10  37.30  36.37  34.34
SO XBADJ    OCB1035-OCB8095   31.26  27.23   1.81   2.77   3.65   4.42
SO YBADJ    OCB1035-OCB8095    3.15   6.27   9.20  11.86  14.15  16.01
SO YBADJ    OCB1035-OCB8095   17.39  25.38  18.53  11.11   3.36  -4.49
SO YBADJ    OCB1035-OCB8095  -12.20 -19.55   9.32   6.40   3.28   0.07
SO YBADJ    OCB1035-OCB8095   -3.15  -6.27  -9.20 -11.86 -14.15 -16.01
SO YBADJ    OCB1035-OCB8095  -17.39 -25.38 -18.53 -11.11  -3.36   4.49
SO YBADJ    OCB1035-OCB8095   12.20  19.55  -9.32  -6.40  -3.28  -0.07


SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCC1035-OCC8095    3.69   2.85   1.92   0.93  -0.08  -1.10
SO XBADJ    OCC1035-OCC8095   -2.07  -2.99 -98.40 -102.57 -103.63 -19.62
SO XBADJ    OCC1035-OCC8095  -23.90 -27.45 -30.17 -31.97 -32.80 -32.64
SO XBADJ    OCC1035-OCC8095  -32.86 -32.08 -30.32 -27.65 -24.14 -19.89
SO XBADJ    OCC1035-OCC8095  -15.03  -9.73  -4.12  -3.29  -2.36  -1.36
SO XBADJ    OCC1035-OCC8095   -0.32   0.73   1.76   2.74   3.63   4.42
SO YBADJ    OCC1035-OCC8095    3.07   6.19   9.13  11.79  14.09  15.97
SO YBADJ    OCC1035-OCC8095   17.36  18.22  18.53   1.85 -14.89  16.12
SO YBADJ    OCC1035-OCC8095   14.29  12.03   9.40   6.48   3.37   0.15
SO YBADJ    OCC1035-OCC8095   -3.07  -6.19  -9.13 -11.79 -14.09 -15.97
SO YBADJ    OCC1035-OCC8095  -17.36 -18.22 -18.53 -18.27 -17.46 -16.12
SO YBADJ    OCC1035-OCC8095  -14.29 -12.03  -9.40  -6.48  -3.37  -0.15


SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.93  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCD1035-OCD8095    3.66   2.81   1.88   0.89  -0.13  -1.14
SO XBADJ    OCD1035-OCD8095   -2.12 -43.51 -44.95 -49.93 -53.40 -55.24
SO XBADJ    OCD1035-OCD8095  -55.40 -53.88 -30.17 -31.97 -32.79 -32.62
SO XBADJ    OCD1035-OCD8095  -32.83 -32.05 -30.29 -27.61 -24.09 -19.84
SO XBADJ    OCD1035-OCD8095  -14.99  30.79  37.02  37.22  36.29  34.26
SO XBADJ    OCD1035-OCD8095   31.18  27.16   1.77   2.74   3.62   4.40
SO YBADJ    OCD1035-OCD8095    3.10   6.22   9.15  11.81  14.10  15.97
SO YBADJ    OCD1035-OCD8095   17.35  25.34  18.51  11.11   3.37  -4.47
SO YBADJ    OCD1035-OCD8095  -12.17 -19.50   9.35   6.44   3.33   0.11
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SO YBADJ    OCD1035-OCD8095   -3.10  -6.22  -9.15 -11.81 -14.10 -15.97
SO YBADJ    OCD1035-OCD8095  -17.35 -25.34 -18.51 -11.11  -3.37   4.47
SO YBADJ    OCD1035-OCD8095   12.17  19.50  -9.35  -6.44  -3.33  -0.11


SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT OSE1035-OSE8095   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00  29.17  29.23  28.41
SO BUILDWID OSE1035-OSE8095   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN OSE1035-OSE8095   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00 -109.32 -74.87 -78.66
SO XBADJ    OSE1035-OSE8095  -80.05 -79.01   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00  20.57  16.44   4.68
SO YBADJ    OSE1035-OSE8095   -7.23 -18.92   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00  52.65  61.55  68.57   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT1  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00  73.51  68.57  61.55   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT1 -101.31 -100.88   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00 -234.42 -235.97 -230.35   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00 -101.33 -101.54   0.00
SO YBADJ    GASHEAT1   4.93 -10.20   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00  40.47   5.54 -29.57   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   8.98  -6.21   0.00


SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5  24.40  24.40  24.40  24.40   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDWID GASHEAT5  26.72  24.22  20.98  17.11   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5  24.22  26.72  28.41  29.23   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5 -125.39 -127.58 -105.33 -106.31   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5  15.32  -4.58  11.28  -4.72   0.00   0.00

SO BUILDHGT GASHEAT2  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00  39.62  39.62  39.62   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00  42.16  52.65  61.55   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00  76.22  73.51  68.57   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00 -211.27 -213.26 -208.77   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -122.76 -125.37   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   6.09  -9.10  11.61  -6.68 -24.77   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00  34.42   3.83 -26.88   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2  17.53  -1.95   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT3  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT GASHEAT3  39.62   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT3  12.71  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00  32.49  26.52
SO BUILDWID GASHEAT3  32.49   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT3  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00 109.04 106.05
SO BUILDLEN GASHEAT3 107.19   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT3 -101.34 -100.93   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00 -219.73 -219.65
SO XBADJ    GASHEAT3 -217.19   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00 -101.27 -101.51   0.00
SO YBADJ    GASHEAT3   5.06 -10.08   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
```

```
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00  26.09  -6.39
SO YBADJ    GASHEAT3 -35.23   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   9.14  -6.05   0.00


SO BUILDHGT GASHEAT4  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00  52.65  42.16  34.02   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00  73.51  76.22 109.04   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4 -101.51 -101.27 -118.50 -118.07 -114.06   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00 -189.51 -195.02 -227.03   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   6.03  -9.15  11.54  -6.75 -24.83   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00  37.31  10.22 -15.36   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00


SO BUILDHGT AUXBOIL    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT AUXBOIL   39.62  39.62   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL    0.00  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL    0.00   0.00   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL   29.23  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL   44.53  42.16   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL    0.00  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL    0.00   0.00   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL   17.11  12.72   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL  107.19  76.22   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL    0.00  12.71   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL    0.00   0.00   0.00 -69.35 -70.49 -105.11
SO XBADJ    AUXBOIL  -105.02 -101.75  0.00  42.64  43.64  43.32
SO XBADJ    AUXBOIL   41.69  38.78   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL  -281.21 -251.71  0.00  42.63  46.27  48.50
SO XBADJ    AUXBOIL    0.00  48.53   0.00 -55.35 -60.75 -64.31
SO XBADJ    AUXBOIL  -65.91 -65.50   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL    0.00   0.00   0.00  18.66   8.66  18.95
SO YBADJ    AUXBOIL    2.24 -14.55   0.00 -22.73 -13.88  -4.60
SO YBADJ    AUXBOIL    4.81  14.08   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL   18.83 -11.36   0.00 -18.66  -8.66   1.61
SO YBADJ    AUXBOIL    0.00  21.69   0.00  22.73  13.88   4.60
SO YBADJ    AUXBOIL   -4.81 -14.08   0.00   0.00   0.00   0.00

   SRCGROUP BASE35  OCA1035 OCB1035 OCC1035 OCD1035 OSE1035
   SRCGROUP BASE35  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP BASE95  OCA1095 OCB1095 OCC1095 OCD1095 OSE1095
   SRCGROUP BASE95  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD8020  OCA8020 OCB8020 OCC8020 OCD8020 OSE8020
   SRCGROUP LD8020  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD8090  OCA8090 OCB8090 OCC8090 OCD8090 OSE8090
   SRCGROUP LD8090  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD6020  OCA6020 OCB6020 OCC6020 OCD6020 OSE6020
   SRCGROUP LD6020  GASHEAT1-GASHEAT5 AUXBOIL
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   SRCGROUP LD6090  OCA6090 OCB6090 OCC6090 OCD6090 OSE6090
   SRCGROUP LD6090  GASHEAT1-GASHEAT5 AUXBOIL

SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED bartow.rou
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE c:\amodmet\TAMPA_2001.SFC
   PROFFILE c:\amodmet\TAMPA_2001.PFL
   SURFDATA 12842 2001 TAMPA_INT'L_ARPT
   UAIRDATA 12842 2001 RUSKIN_AP
   PROFBASE 19 FEET
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST
OU FINISHED
```

AERBOB RELEASE 020304
AERMOD OUTPUT FILE NUMBER 1 :cccofo.o01
AERMOD OUTPUT FILE NUMBER 2 :cccofo.o02
AERMOD OUTPUT FILE NUMBER 3 :cccofo.o03
AERMOD OUTPUT FILE NUMBER 4 :cccofo.o04
AERMOD OUTPUT FILE NUMBER 5 :cccofo.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, CO LOAD ANALYSIS, FUEL OIL 7/22/06
Second title for last output file is: TAMPA/TAMPA 2001-2005

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE35					
HIGH 24-Hour					
	2001	41.5	342050.	3081750.	01110524
	2002	33.3	342550.	3081850.	02022724
	2003	39.6	342050.	3081850.	03112924
	2004	53.6	342250.	3082050.	04090524
	2005	43.5	341750.	3082750.	05070924
HIGH 8-Hour					
	2001	58.3	342850.	3081850.	01091508
	2002	59.9	341550.	3082650.	02030124
	2003	65.4	342050.	3081750.	03112908
	2004	107.5	342350.	3082050.	04092608
	2005	104.7	342150.	3082050.	05102408
HIGH 3-Hour					
	2001	92.3	342750.	3081950.	01091503
	2002	108.5	341750.	3082150.	02120921
	2003	85.8	342150.	3081750.	03112906
	2004	131.5	342250.	3082050.	04092524
	2005	135.1	342150.	3082050.	05102406
HIGH 1-Hour					
	2001	144.5	342150.	3082050.	01091407
	2002	134.6	342450.	3082050.	02022706
	2003	121.0	342250.	3081950.	03012320
	2004	152.8	342350.	3082050.	04092607
	2005	145.5	342150.	3082050.	05102405
SOURCE GROUP ID: BASE95					
HIGH 24-Hour					
	2001	42.4	342050.	3081750.	01110524
	2002	33.2	342550.	3081950.	02022724
	2003	40.0	342050.	3081850.	03112924
	2004	55.8	342250.	3082050.	04090524
	2005	43.3	341750.	3082750.	05070924
HIGH 8-Hour					
	2001	58.4	342850.	3081850.	01091508
	2002	60.8	341550.	3082650.	02030124
	2003	65.6	341950.	3081850.	03110924
	2004	108.4	342350.	3082050.	04092608
	2005	106.1	342150.	3082050.	05102408
HIGH 3-Hour					
	2001	91.9	342150.	3082050.	01091409
	2002	107.2	341750.	3082150.	02120921
	2003	85.6	342050.	3081850.	03112903
	2004	134.4	342250.	3082050.	04092524
	2005	135.6	342150.	3082050.	05102406
HIGH 1-Hour					
	2001	143.5	342150.	3082150.	01091407
	2002	134.9	342450.	3082050.	02022706
	2003	126.1	342450.	3082050.	03112823
	2004	150.5	342350.	3082050.	04092605
	2005	145.0	342250.	3082150.	05102407
SOURCE GROUP ID: LD8020					
HIGH 24-Hour					
	2001	39.1	342050.	3081750.	01110524
	2002	30.5	342550.	3081950.	02022724
	2003	36.8	342050.	3081850.	03112924
	2004	51.3	342250.	3082050.	04090524
	2005	39.7	341750.	3082750.	05070924
HIGH 8-Hour					
	2001	53.8	342850.	3081850.	01091508
	2002	55.8	341550.	3082650.	02030124
	2003	60.4	341950.	3081850.	03110924
	2004	99.1	342350.	3082050.	04092608
	2005	97.2	342150.	3082050.	05102408
HIGH 3-Hour					
	2001	84.3	342150.	3082050.	01091409

2002	98.0	341750.	3082150.	02120921
2003	78.5	342050.	3081850.	03112903
2004	123.2	342250.	3082050.	04092524
2005	123.9	342150.	3082050.	05102406
HIGH 1-Hour				
2001	132.3	342150.	3082150.	01091407
2002	123.2	342450.	3082050.	02022706
2003	116.4	342450.	3082050.	03112823
2004	137.2	342350.	3082150.	04092607
2005	132.7	342250.	3082150.	05102407
SOURCE GROUP ID: LD8090				
HIGH 24-Hour				
2001	40.5	342850.	3082050.	01030524
2002	32.5	342450.	3082050.	02022724
2003	37.7	342150.	3081950.	03112924
2004	53.5	342250.	3082050.	04090524
2005	41.5	342250.	3082050.	05102424
HIGH 8-Hour				
2001	55.7	342450.	3082050.	01091424
2002	57.8	341650.	3082850.	02030208
2003	61.8	341950.	3081850.	03110924
2004	99.5	342350.	3082150.	04092608
2005	100.1	342150.	3082050.	05102408
HIGH 3-Hour				
2001	85.3	342150.	3082050.	01091409
2002	103.5	341850.	3082250.	02120921
2003	79.7	342050.	3081850.	03112903
2004	124.4	342250.	3082050.	04092524
2005	122.2	342150.	3082050.	05102406
HIGH 1-Hour				
2001	137.5	342150.	3082150.	01091407
2002	122.4	342350.	3082050.	02022706
2003	122.7	342450.	3082050.	03112823
2004	137.8	342350.	3082150.	04092607
2005	137.7	341950.	3082650.	05070922
SOURCE GROUP ID: LD6020				
HIGH 24-Hour				
2001	35.7	342050:	3081750.	01110524
2002	28.0	342550.	3081950.	02022724
2003	33.3	342050.	3081850.	03112924
2004	47.0	342250.	3082050.	04090524
2005	36.2	342250.	3082050.	05102424
HIGH 8-Hour				
2001	48.3	342850.	3081850.	01091508
2002	50.9	341650.	3082650.	02030124
2003	54.9	341950.	3081850.	03110924
2004	88.7	342350.	3082050.	04092608
2005	88.2	342150.	3082050.	05102408
HIGH 3-Hour				
2001	76.1	342150.	3082050.	01091409
2002	89.2	341850.	3082250.	02120921
2003	70.8	342050.	3081850.	03112903
2004	111.2	342250.	3082050.	04092524
2005	110.2	342150.	3082050.	05102406
HIGH 1-Hour				
2001	121.5	342150.	3082150.	01091407
2002	109.5	342350.	3082050.	02022706
2003	107.6	342450.	3082050.	03112823
2004	123.3	342350.	3082150.	04092607
2005	119.2	341850.	3082650.	05070920
SOURCE GROUP ID: LD6090				
HIGH 24-Hour				
2001	37.7	342850.	3082050.	01030524
2002	30.6	342450.	3082050.	02022724
2003	35.5	342150.	3081950.	03112924
2004	49.0	342250.	3082050.	04090524
2005	38.6	341850.	3082650.	05070924
HIGH 8-Hour				
2001	52.2	342450.	3082050.	01091424
2002	53.4	341650.	3082850.	02030208
2003	56.9	341950.	3081850.	03110924
2004	92.3	342350.	3082150.	04092608
2005	92.0	342150.	3082050.	05102408
HIGH 3-Hour				
2001	77.6	342150.	3082050.	01091409
2002	97.1	341850.	3082250.	02120921
2003	72.9	342050.	3081850.	03112903
2004	113.0	342250.	3082050.	04092524
2005	112.3	342150.	3082150.	05102406

HIGH 1-Hour

2001	126.0	342150.	3082150.	01091407
2002	112.7	341850.	3082250.	02120919
2003	112.7	342450.	3082050.	03112823
2004	125.0	342350.	3082150.	04092607
2005	128.3	341950.	3082650.	05070922

All receptor computations reported with respect to a user-specified origin

GRID 0.00 0.00

DISCRETE 0.00 0.00

```
CO STARTING
  TITLEONE 2001 BARTOW REPOWERING, AERMOD, NOX LOAD ANALYSIS, FUEL OIL 7/22/06
  TITLETWO TAMPA/TAMPA 2001-2005, NO SCR ASSUMED FOR CC EMISSIONS
  MODELOPT DFAULT CONC
  AVERTIME PERIOD
  POLLUTID NOX
  RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


  LOCATION OCA1035 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1035 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1035 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1035 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1035 POINT 342140.890 3082493.580 0.000
  LOCATION OCA1095 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1095 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1095 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1095 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1095 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8090 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6090 POINT 342140.890 3082493.580 0.000
  LOCATION GASHEAT1 POINT 342217.500 3082540.000 0.000
  LOCATION GASHEAT5 POINT 342161.790 3082540.000 0.000
  LOCATION GASHEAT2 POINT 342259.810 3082540.000 0.000
  LOCATION GASHEAT3 POINT 342353.350 3082540.000 0.000
  LOCATION GASHEAT4 POINT 342395.440 3082540.000 0.000
  LOCATION  AUXBOIL POINT 342289.000 3082486.340 0.000

** Source Parameters **
  SRCPARAM OCA1035 42.08 36.6 382.0 24.7 5.49
  SRCPARAM OCB1035 42.08 36.6 382.0 24.7 5.49
  SRCPARAM OCC1035 42.08 36.6 382.0 24.7 5.49
  SRCPARAM OCD1035 42.08 36.6 382.0 24.7 5.49
  SRCPARAM OSE1035 42.08 36.6 828.0 35.8 6.71

  SRCPARAM OCA1095 37.55 36.6 382.0 22.4 5.49
  SRCPARAM OCB1095 37.55 36.6 382.0 22.4 5.49
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   SRCPARAM OCC1095 37.55 36.6 382.0 22.4 5.49
   SRCPARAM OCD1095 37.55 36.6 382.0 22.4 5.49
   SRCPARAM OSE1095 37.55 36.6 851.0 33.3 6.71

   SRCPARAM OCA8020 34.06 36.6 382.0 22.0 5.49
   SRCPARAM OCB8020 34.06 36.6 382.0 22.0 5.49
   SRCPARAM OCC8020 34.06 36.6 382.0 22.0 5.49
   SRCPARAM OCD8020 34.06 36.6 382.0 22.0 5.49
   SRCPARAM OSE8020 34.06 36.6 878.0 33.9 6.71

   SRCPARAM OCA8090 28.23 36.6 382.0 18.7 5.49
   SRCPARAM OCB8090 28.23 36.6 382.0 18.7 5.49
   SRCPARAM OCC8090 28.23 36.6 382.0 18.7 5.49
   SRCPARAM OCD8090 28.23 36.6 382.0 18.7 5.49
   SRCPARAM OSE8090 28.23 36.6 905.0 29.7 6.71

   SRCPARAM OCA6020 28.63 36.6 382.0 20.2 5.49
   SRCPARAM OCB6020 28.63 36.6 382.0 20.2 5.49
   SRCPARAM OCC6020 28.63 36.6 382.0 20.2 5.49
   SRCPARAM OCD6020 28.63 36.6 382.0 20.2 5.49
   SRCPARAM OSE6020 28.63 36.6 905.0 32.0 6.71

   SRCPARAM OCA6090 24.45 36.6 382.0 17.7 5.49
   SRCPARAM OCB6090 24.45 36.6 382.0 17.7 5.49
   SRCPARAM OCC6090 24.45 36.6 382.0 17.7 5.49
   SRCPARAM OCD6090 24.45 36.6 382.0 17.7 5.49
   SRCPARAM OSE6090 24.45 36.6 922.0 28.6 6.71

   SRCPARAM GASHEAT1 0.037 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT5 0.037 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT2 0.037 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT3 0.037 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT4 0.037 18.3 533.0  7.92 0.61
   SRCPARAM  AUXBOIL 0.611 18.3 420.0 24.69 0.84

** Building Downwash **
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCA1035-OCA8095    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDWID OCA1035-OCA8095    12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095    26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN OCA1035-OCA8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCA1035-OCA8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCA1035-OCA8095    3.69   2.83   1.88   0.88  -0.15  -1.17
SO XBADJ    OCA1035-OCA8095   -2.16  -3.08  -3.91  -9.53 -14.85 -19.72
SO XBADJ    OCA1035-OCA8095  -23.99 -27.53 -30.24 -32.03 -32.84 -32.66
SO XBADJ    OCA1035-OCA8095  -32.86 -32.06 -30.29 -27.60 -24.07 -19.81
SO XBADJ    OCA1035-OCA8095  -14.95  -9.63  -4.02  -3.19  -2.26  -1.27
SO XBADJ    OCA1035-OCA8095   -0.23   0.81   1.83   2.79   3.67   4.44
SO YBADJ    OCA1035-OCA8095    3.17   6.29   9.23  11.88  14.17  16.03
SO YBADJ    OCA1035-OCA8095   17.41  18.26  18.55  18.27  17.45  16.09
SO YBADJ    OCA1035-OCA8095   14.24  11.96   9.32   6.39   3.27   0.05
SO YBADJ    OCA1035-OCA8095   -3.17  -6.29  -9.23 -11.88 -14.17 -16.03
SO YBADJ    OCA1035-OCA8095  -17.41 -18.26 -18.55 -18.27 -17.45 -16.09
SO YBADJ    OCA1035-OCA8095  -14.24 -11.96  -9.32  -6.39  -3.27  -0.05


SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
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SO BUILDWID OCB1035-OCB8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCB1035-OCB8095   3.67  2.82  1.87  0.88  -0.15  -1.17
SO XBADJ    OCB1035-OCB8095   -2.15  -43.58  -45.03  -50.02  -53.48  -55.32
SO XBADJ    OCB1035-OCB8095   -55.48  -53.95  -30.21  -32.00  -32.82  -32.64
SO XBADJ    OCB1035-OCB8095   -32.84  -32.05  -30.28  -27.60  -24.07  -19.81
SO XBADJ    OCB1035-OCB8095   -14.95  30.87  37.10  37.30  36.37  34.34
SO XBADJ    OCB1035-OCB8095   31.26  27.23  1.81  2.77  3.65  4.42
SO YBADJ    OCB1035-OCB8095   3.15  6.27  9.20  11.86  14.15  16.01
SO YBADJ    OCB1035-OCB8095   17.39  25.38  18.53  11.11  3.36  -4.49
SO YBADJ    OCB1035-OCB8095   -12.20  -19.55  9.32  6.40  3.28  0.07
SO YBADJ    OCB1035-OCB8095   -3.15  -6.27  -9.20  -11.86  -14.15  -16.01
SO YBADJ    OCB1035-OCB8095   -17.39  -25.38  -18.53  -11.11  -3.36  4.49
SO YBADJ    OCB1035-OCB8095   12.20  19.55  -9.32  -6.40  -3.28  -0.07

SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCC1035-OCC8095   3.69  2.85  1.92  0.93  -0.08  -1.10
SO XBADJ    OCC1035-OCC8095   -2.07  -2.99  -98.40  -102.57  -103.63  -19.62
SO XBADJ    OCC1035-OCC8095   -23.90  -27.45  -30.17  -31.97  -32.80  -32.64
SO XBADJ    OCC1035-OCC8095   -32.86  -32.08  -30.32  -27.65  -24.14  -19.89
SO XBADJ    OCC1035-OCC8095   -15.03  -9.73  -4.12  -3.29  -2.36  -1.36
SO XBADJ    OCC1035-OCC8095   -0.32  0.73  1.76  2.74  3.63  4.42
SO YBADJ    OCC1035-OCC8095   3.07  6.19  9.13  11.79  14.09  15.97
SO YBADJ    OCC1035-OCC8095   17.36  18.22  18.53  1.85  -14.89  16.12
SO YBADJ    OCC1035-OCC8095   14.29  12.03  9.40  6.48  3.37  0.15
SO YBADJ    OCC1035-OCC8095   -3.07  -6.19  -9.13  -11.79  -14.09  -15.97
SO YBADJ    OCC1035-OCC8095   -17.36  -18.22  -18.53  -18.27  -17.46  -16.12
SO YBADJ    OCC1035-OCC8095   -14.29  -12.03  -9.40  -6.48  -3.37  -0.15

SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.93  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCD1035-OCD8095   3.66  2.81  1.88  0.89  -0.13  -1.14
SO XBADJ    OCD1035-OCD8095   -2.12  -43.51  -44.95  -49.93  -53.40  -55.24
SO XBADJ    OCD1035-OCD8095   -55.40  -53.88  -30.17  -31.97  -32.79  -32.62
SO XBADJ    OCD1035-OCD8095   -32.83  -32.05  -30.29  -27.61  -24.09  -19.84
SO XBADJ    OCD1035-OCD8095   -14.99  30.79  37.02  37.22  36.29  34.26
SO XBADJ    OCD1035-OCD8095   31.18  27.16  1.77  2.74  3.62  4.40
SO YBADJ    OCD1035-OCD8095   3.10  6.22  9.15  11.81  14.10  15.97
SO YBADJ    OCD1035-OCD8095   17.35  25.34  18.51  11.11  3.37  -4.47
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SO YBADJ    OCD1035-OCD8095   -12.17 -19.50   9.35   6.44   3.33   0.11
SO YBADJ    OCD1035-OCD8095    -3.10  -6.22  -9.15 -11.81 -14.10 -15.97
SO YBADJ    OCD1035-OCD8095   -17.35 -25.34 -18.51 -11.11  -3.37   4.47
SO YBADJ    OCD1035-OCD8095    12.17  19.50  -9.35  -6.44  -3.33  -0.11


SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT OSE1035-OSE8095   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00  29.17  29.23  28.41
SO BUILDWID OSE1035-OSE8095   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN OSE1035-OSE8095   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00 -109.32 -74.87 -78.66
SO XBADJ    OSE1035-OSE8095  -80.05 -79.01   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00  20.57  16.44   4.68
SO YBADJ    OSE1035-OSE8095   -7.23 -18.92   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00  52.65  61.55  68.57   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT1  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00  73.51  68.57  61.55   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT1 -101.31 -100.88   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00 -234.42 -235.97 -230.35   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00 -101.33 -101.54   0.00
SO YBADJ    GASHEAT1   4.93 -10.20   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00  40.47   5.54 -29.57   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   8.98  -6.21   0.00


SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5  24.40  24.40  24.40  24.40   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5  26.72  24.22  20.98  17.11   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5  24.22  26.72  28.41  29.23   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5 -125.39 -127.58 -105.33 -106.31   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5  15.32  -4.58  11.28  -4.72   0.00   0.00

SO BUILDHGT GASHEAT2  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00  39.62  39.62  39.62   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00  42.16  52.65  61.55   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00  76.22  73.51  68.57   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00 -211.27 -213.26 -208.77   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -122.76 -125.37   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   6.09  -9.10  11.61  -6.68 -24.77   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00  34.42   3.83 -26.88   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2  17.53  -1.95   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT3  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT GASHEAT3  39.62   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT3  12.71  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00  32.49  26.52
SO BUILDWID GASHEAT3  32.49   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT3  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00 109.04 106.05
SO BUILDLEN GASHEAT3 107.19   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT3 -101.34 -100.93   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00 -219.73 -219.65
SO XBADJ    GASHEAT3 -217.19   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00 -101.27 -101.51   0.00
SO YBADJ    GASHEAT3   5.06 -10.08   0.00   0.00   0.00   0.00
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SO YBADJ    GASHEAT3  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3  0.00   0.00   0.00   0.00  26.09  -6.39
SO YBADJ    GASHEAT3 -35.23  0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3  0.00   0.00   0.00   9.14  -6.05   0.00


SO BUILDHGT GASHEAT4  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00  52.65  42.16  34.02   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00  73.51  76.22 109.04   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4 -101.51 -101.27 -118.50 -118.07 -114.06   0.00
SO XBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4  0.00   0.00 -189.51 -195.02 -227.03   0.00
SO XBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4  6.03  -9.15  11.54  -6.75 -24.83   0.00
SO YBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4  0.00   0.00  37.31  10.22 -15.36   0.00
SO YBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4  0.00   0.00   0.00   0.00   0.00   0.00


SO BUILDHGT AUXBOIL    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT AUXBOIL   39.62  39.62   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL    0.00  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL    0.00   0.00   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL   29.23  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL   44.53  42.16   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL    0.00  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL    0.00   0.00   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL   17.11  12.72   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL  107.19  76.22   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL    0.00  12.71   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL   0.00   0.00   0.00 -69.35 -70.49 -105.11
SO XBADJ    AUXBOIL -105.02 -101.75  0.00  42.64  43.64  43.32
SO XBADJ    AUXBOIL  41.69  38.78   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL -281.21 -251.71  0.00  42.63  46.27  48.50
SO XBADJ    AUXBOIL   0.00  48.53   0.00 -55.35 -60.75 -64.31
SO XBADJ    AUXBOIL -65.91 -65.50   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL   0.00   0.00   0.00  18.66   8.66  18.95
SO YBADJ    AUXBOIL   2.24 -14.55   0.00 -22.73 -13.88  -4.60
SO YBADJ    AUXBOIL   4.81  14.08   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL  18.83 -11.36   0.00 -18.66  -8.66   1.61
SO YBADJ    AUXBOIL   0.00  21.69   0.00  22.73  13.88   4.60
SO YBADJ    AUXBOIL  -4.81 -14.08   0.00   0.00   0.00   0.00

  SRCGROUP BASE35  OCA1035 OCB1035 OCC1035 OCD1035 OSE1035
  SRCGROUP BASE35  GASHEAT1-GASHEAT5 AUXBOIL
  SRCGROUP BASE95  OCA1095 OCB1095 OCC1095 OCD1095 OSE1095
  SRCGROUP BASE95  GASHEAT1-GASHEAT5 AUXBOIL
  SRCGROUP LD8020  OCA8020 OCB8020 OCC8020 OCD8020 OSE8020
  SRCGROUP LD8020  GASHEAT1-GASHEAT5 AUXBOIL
  SRCGROUP LD8090  OCA8090 OCB8090 OCC8090 OCD8090 OSE8090
  SRCGROUP LD8090  GASHEAT1-GASHEAT5 AUXBOIL
  SRCGROUP LD6020  OCA6020 OCB6020 OCC6020 OCD6020 OSE6020
```

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   SRCGROUP LD6020  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD6090  OCA6090 OCB6090 OCC6090 OCD6090 OSE6090
   SRCGROUP LD6090  GASHEAT1-GASHEAT5 AUXBOIL

SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED bartow.rou
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE c:\amodmet\TAMPA_2001.SFC
   PROFFILE c:\amodmet\TAMPA_2001.PFL
   SURFDATA 12842 2001 TAMPA_INT'L_ARPT
   UAIRDATA 12842 2001 RUSKIN_AP
   PROFBASE 19 FEET
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST
OU FINISHED
```

AERBOB RELEASE 020304

AERMOD OUTPUT FILE NUMBER 1 :ccnoxfo.o01
AERMOD OUTPUT FILE NUMBER 2 :ccnoxfo.o02
AERMOD OUTPUT FILE NUMBER 3 :ccnoxfo.o03
AERMOD OUTPUT FILE NUMBER 4 :ccnoxfo.o04
AERMOD OUTPUT FILE NUMBER 5 :ccnoxfo.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, NOX LOAD ANALYSIS, FUEL OIL 7/22/06
Second title for last output file is: TAMPA/TAMPA 2001-2005, NO SCR ASSUMED FOR CC EMISSIONS

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE35					
Annual					
	2001	6.70	341850.	3082250.	01123124
	2002	6.33	341750.	3082350.	02123124
	2003	5.03	342050.	3081950.	03123124
	2004	5.57	341750.	3082350.	04123124
	2005	7.03	341850.	3082150.	05123124
SOURCE GROUP ID: BASE95					
Annual					
	2001	6.67	341850.	3082250.	01123124
	2002	6.26	341850.	3082250.	02123124
	2003	5.02	342050.	3081950.	03123124
	2004	5.52	341850.	3082250.	04123124
	2005	7.01	341850.	3082150.	05123124
SOURCE GROUP ID: LD8020					
Annual					
	2001	6.23	341850.	3082250.	01123124
	2002	5.85	341850.	3082250.	02123124
	2003	4.67	342050.	3081950.	03123124
	2004	5.16	341850.	3082250.	04123124
	2005	6.55	341850.	3082150.	05123124
SOURCE GROUP ID: LD8090					
Annual					
	2001	6.15	341850.	3082250.	01123124
	2002	5.76	341850.	3082350.	02123124
	2003	4.61	342050.	3081950.	03123124
	2004	5.07	341850.	3082250.	04123124
	2005	6.51	341950.	3082150.	05123124
SOURCE GROUP ID: LD6020					
Annual					
	2001	5.81	341850.	3082250.	01123124
	2002	5.44	341850.	3082250.	02123124
	2003	4.34	342050.	3081950.	03123124
	2004	4.81	341850.	3082250.	04123124
	2005	6.12	341850.	3082150.	05123124
SOURCE GROUP ID: LD6090					
Annual					
	2001	5.71	341850.	3082250.	01123124
	2002	5.33	341850.	3082350.	02123124
	2003	4.28	342150.	3081950.	03123124
	2004	4.71	341850.	3082250.	04123124
	2005	6.09	341950.	3082150.	05123124

All receptor computations reported with respect to a user-specified origin
GRID 0.00 0.00
DISCRETE 0.00 0.00

```
CO STARTING
  TITLEONE 2001 BARTOW REPOWERING, AERMOD, PM10 SIG, FUEL OIL    7/22/06
  TITLETWO TAMPA/TAMPA 2001-2005
  MODELOPT DFAULT CONC
  AVERTIME PERIOD 24
  POLLUTID PM.10
  RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


  LOCATION OCA1035 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1035 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1035 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1035 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1035 POINT 342140.890 3082493.580 0.000
  LOCATION OCA1095 POINT 342197.530 3082436.900 0.000
  LOCATION OCB1095 POINT 342238.650 3082436.920 0.000
  LOCATION OCC1095 POINT 342333.150 3082436.920 0.000
  LOCATION OCD1095 POINT 342374.290 3082436.940 0.000
  LOCATION OSE1095 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA8090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB8090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC8090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD8090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE8090 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6020 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6020 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6020 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6020 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6020 POINT 342140.890 3082493.580 0.000
  LOCATION OCA6090 POINT 342197.530 3082436.900 0.000
  LOCATION OCB6090 POINT 342238.650 3082436.920 0.000
  LOCATION OCC6090 POINT 342333.150 3082436.920 0.000
  LOCATION OCD6090 POINT 342374.290 3082436.940 0.000
  LOCATION OSE6090 POINT 342140.890 3082493.580 0.000
  LOCATION GASHEAT1 POINT 342217.500 3082540.000 0.000
  LOCATION GASHEAT5 POINT 342161.790 3082540.000 0.000
  LOCATION GASHEAT2 POINT 342259.810 3082540.000 0.000
  LOCATION GASHEAT3 POINT 342353.350 3082540.000 0.000
  LOCATION GASHEAT4 POINT 342395.440 3082540.000 0.000
  LOCATION  AUXBOIL POINT 342289.000 3082486.340 0.000
  LOCATION BLR1 POINT 342387.400 3082718.970 0.000
  LOCATION BLR2 POINT 342387.400 3082686.580 0.000
  LOCATION BLR3 POINT 342387.400 3082653.580 0.000

** Source Parameters **
  SRCPARAM OCA1035 10.12 36.6 382.0 24.7 5.49
  SRCPARAM OCB1035 10.12 36.6 382.0 24.7 5.49
  SRCPARAM OCC1035 10.12 36.6 382.0 24.7 5.49
  SRCPARAM OCD1035 10.12 36.6 382.0 24.7 5.49
  SRCPARAM OSE1035  7.56 36.6 828.0 35.8 6.71
```

```
   SRCPARAM OCA1095  9.84 36.6 382.0 22.4 5.49
   SRCPARAM OCB1095  9.84 36.6 382.0 22.4 5.49
   SRCPARAM OCC1095  9.84 36.6 382.0 22.4 5.49
   SRCPARAM OCD1095  9.84 36.6 382.0 22.4 5.49
   SRCPARAM OSE1095  7.56 36.6 851.0 33.3 6.71

   SRCPARAM OCA8020  9.60 36.6 382.0 22.0 5.49
   SRCPARAM OCB8020  9.60 36.6 382.0 22.0 5.49
   SRCPARAM OCC8020  9.60 36.6 382.0 22.0 5.49
   SRCPARAM OCD8020  9.60 36.6 382.0 22.0 5.49
   SRCPARAM OSE8020  7.56 36.6 878.0 33.9 6.71

   SRCPARAM OCA8090  9.25 36.6 382.0 18.7 5.49
   SRCPARAM OCB8090  9.25 36.6 382.0 18.7 5.49
   SRCPARAM OCC8090  9.25 36.6 382.0 18.7 5.49
   SRCPARAM OCD8090  9.25 36.6 382.0 18.7 5.49
   SRCPARAM OSE8090  7.56 36.6 905.0 29.7 6.71

   SRCPARAM OCA6020  9.28 36.6 382.0 20.2 5.49
   SRCPARAM OCB6020  9.28 36.6 382.0 20.2 5.49
   SRCPARAM OCC6020  9.28 36.6 382.0 20.2 5.49
   SRCPARAM OCD6020  9.28 36.6 382.0 20.2 5.49
   SRCPARAM OSE6020  7.56 36.6 905.0 32.0 6.71

   SRCPARAM OCA6090  9.02 36.6 382.0 17.7 5.49
   SRCPARAM OCB6090  9.02 36.6 382.0 17.7 5.49
   SRCPARAM OCC6090  9.02 36.6 382.0 17.7 5.49
   SRCPARAM OCD6090  9.02 36.6 382.0 17.7 5.49
   SRCPARAM OSE6090  7.56 36.6 922.0 28.6 6.71

   SRCPARAM GASHEAT1 0.00063 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT5 0.00063 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT2 0.00063 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT3 0.00063 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT4 0.00063 18.3 533.0  7.92 0.61
   SRCPARAM  AUXBOIL 0.02268 18.3 420.0 24.69 0.84

** SOURCES TO BE SHUTDOWN
   SRCPARAM BLR1 -15.37 91.4 428.7 36.30 2.74
   SRCPARAM BLR2 -16.59 91.4 424.8 31.09 2.74
   SRCPARAM BLR3 -27.86 91.4 408.2 34.44 3.35
** Building Downwash **
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095     29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095     29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095     17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095     17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCA1035-OCA8095      3.69   2.83   1.88   0.88  -0.15  -1.17
SO XBADJ    OCA1035-OCA8095     -2.16  -3.08  -3.91  -9.53 -14.85 -19.72
SO XBADJ    OCA1035-OCA8095    -23.99 -27.53 -30.24 -32.03 -32.84 -32.66
SO XBADJ    OCA1035-OCA8095    -32.86 -32.06 -30.29 -27.60 -24.07 -19.81
SO XBADJ    OCA1035-OCA8095    -14.95  -9.63  -4.02  -3.19  -2.26  -1.27
SO XBADJ    OCA1035-OCA8095     -0.23   0.81   1.83   2.79   3.67   4.44
SO YBADJ    OCA1035-OCA8095      3.17   6.29   9.23  11.88  14.17  16.03
SO YBADJ    OCA1035-OCA8095     17.41  18.26  18.55  18.27  17.45  16.09
SO YBADJ    OCA1035-OCA8095     14.24  11.96   9.32   6.39   3.27   0.05
SO YBADJ    OCA1035-OCA8095     -3.17  -6.29  -9.23 -11.88 -14.17 -16.03
SO YBADJ    OCA1035-OCA8095    -17.41 -18.26 -18.55 -18.27 -17.45 -16.09
SO YBADJ    OCA1035-OCA8095    -14.24 -11.96  -9.32  -6.39  -3.27  -0.05


SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
```

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SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCB1035-OCB8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCB1035-OCB8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095    17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCB1035-OCB8095    3.67  2.82  1.87  0.88  -0.15  -1.17
SO XBADJ    OCB1035-OCB8095    -2.15 -43.58 -45.03 -50.02 -53.48 -55.32
SO XBADJ    OCB1035-OCB8095    -55.48 -53.95 -30.21 -32.00 -32.82 -32.64
SO XBADJ    OCB1035-OCB8095    -32.84 -32.05 -30.28 -27.60 -24.07 -19.81
SO XBADJ    OCB1035-OCB8095    -14.95  30.87  37.10  37.30  36.37  34.34
SO XBADJ    OCB1035-OCB8095    31.26  27.23  1.81  2.77  3.65  4.42
SO YBADJ    OCB1035-OCB8095    3.15  6.27  9.20  11.86  14.15  16.01
SO YBADJ    OCB1035-OCB8095    17.39  25.38  18.53  11.11  3.36  -4.49
SO YBADJ    OCB1035-OCB8095    -12.20 -19.55  9.32  6.40  3.28  0.07
SO YBADJ    OCB1035-OCB8095    -3.15  -6.27  -9.20 -11.86 -14.15 -16.01
SO YBADJ    OCB1035-OCB8095    -17.39 -25.38 -18.53 -11.11  -3.36  4.49
SO YBADJ    OCB1035-OCB8095    12.20  19.55  -9.32  -6.40  -3.28  -0.07


SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCC1035-OCC8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCC1035-OCC8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCC1035-OCC8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCC1035-OCC8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCC1035-OCC8095    3.69  2.85  1.92  0.93  -0.08  -1.10
SO XBADJ    OCC1035-OCC8095    -2.07  -2.99 -98.40 -102.57 -103.63 -19.62
SO XBADJ    OCC1035-OCC8095    -23.90 -27.45 -30.17 -31.97 -32.80 -32.64
SO XBADJ    OCC1035-OCC8095    -32.86 -32.08 -30.32 -27.65 -24.14 -19.89
SO XBADJ    OCC1035-OCC8095    -15.03  -9.73  -4.12  -3.29  -2.36  -1.36
SO XBADJ    OCC1035-OCC8095    -0.32  0.73  1.76  2.74  3.63  4.42
SO YBADJ    OCC1035-OCC8095    3.07  6.19  9.13  11.79  14.09  15.97
SO YBADJ    OCC1035-OCC8095    17.36  18.22  18.53  1.85 -14.89  16.12
SO YBADJ    OCC1035-OCC8095    14.29  12.03  9.40  6.48  3.37  0.15
SO YBADJ    OCC1035-OCC8095    -3.07  -6.19  -9.13 -11.79 -14.09 -15.97
SO YBADJ    OCC1035-OCC8095    -17.36 -18.22 -18.53 -18.27 -17.46 -16.12
SO YBADJ    OCC1035-OCC8095    -14.29 -12.03  -9.40  -6.48  -3.37  -0.15


SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCD1035-OCD8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCD1035-OCD8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095    29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095    26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCD1035-OCD8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095    17.11  12.71   7.93  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095    24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCD1035-OCD8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095    17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095    24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCD1035-OCD8095    3.66  2.81  1.88  0.89  -0.13  -1.14
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SO XBADJ    OCD1035-OCD8095   -2.12 -43.51 -44.95 -49.93 -53.40 -55.24
SO XBADJ    OCD1035-OCD8095  -55.40 -53.88 -30.17 -31.97 -32.79 -32.62
SO XBADJ    OCD1035-OCD8095  -32.83 -32.05 -30.29 -27.61 -24.09 -19.84
SO XBADJ    OCD1035-OCD8095  -14.99  30.79  37.02  37.22  36.29  34.26
SO XBADJ    OCD1035-OCD8095   31.18  27.16   1.77   2.74   3.62   4.40
SO YBADJ    OCD1035-OCD8095    3.10   6.22   9.15  11.81  14.10  15.97
SO YBADJ    OCD1035-OCD8095   17.35  25.34  18.51  11.11   3.37  -4.47
SO YBADJ    OCD1035-OCD8095  -12.17 -19.50   9.35   6.44   3.33   0.11
SO YBADJ    OCD1035-OCD8095   -3.10  -6.22  -9.15 -11.81 -14.10 -15.97
SO YBADJ    OCD1035-OCD8095  -17.35 -25.34 -18.51 -11.11  -3.37   4.47
SO YBADJ    OCD1035-OCD8095   12.17  19.50  -9.35  -6.44  -3.33  -0.11


SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT OSE1035-OSE8095   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095    0.00   0.00   0.00  29.17  29.23  28.41
SO BUILDWID OSE1035-OSE8095   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095    0.00   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN OSE1035-OSE8095   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095    0.00   0.00   0.00 -109.32 -74.87 -78.66
SO XBADJ    OSE1035-OSE8095  -80.05 -79.01   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095    0.00   0.00   0.00  20.57  16.44   4.68
SO YBADJ    OSE1035-OSE8095   -7.23 -18.92   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00  52.65  61.55  68.57   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT1  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00  73.51  68.57  61.55   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT1 -101.31 -100.88  0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00 -234.42 -235.97 -230.35  0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00 -101.33 -101.54  0.00
SO YBADJ    GASHEAT1   4.93 -10.20   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00  40.47   5.54 -29.57   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   8.98  -6.21   0.00


SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5  24.40  24.40  24.40  24.40   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5  26.72  24.22  20.98  17.11   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5  24.22  26.72  28.41  29.23   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5 -125.39 -127.58 -105.33 -106.31   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5  15.32  -4.58  11.28  -4.72   0.00   0.00


SO BUILDHGT GASHEAT2  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00  39.62  39.62  39.62   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00  42.16  52.65  61.55   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00  76.22  73.51  68.57   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00 -211.27 -213.26 -208.77   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -122.76 -125.37   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   6.09  -9.10  11.61  -6.68 -24.77   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00  34.42   3.83 -26.88   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2  17.53  -1.95   0.00   0.00   0.00   0.00


SO BUILDHGT GASHEAT3  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT GASHEAT3  39.62   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT3  12.71  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00  32.49  26.52
SO BUILDWID GASHEAT3  32.49   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT3  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00 109.04 106.05
SO BUILDLEN GASHEAT3 107.19   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00  29.23  29.17   0.00
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SO XBADJ    GASHEAT3 -101.34 -100.93   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3    0.00    0.00   0.00    0.00 -219.73 -219.65
SO XBADJ    GASHEAT3 -217.19    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT3    0.00    0.00   0.00 -101.27 -101.51    0.00
SO YBADJ    GASHEAT3    5.06  -10.08   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3    0.00    0.00   0.00    0.00   26.09   -6.39
SO YBADJ    GASHEAT3  -35.23    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT3    0.00    0.00   0.00    9.14   -6.05    0.00


SO BUILDHGT GASHEAT4   24.40   24.40  24.40   24.40   24.40    0.00
SO BUILDHGT GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4    0.00    0.00  39.62   39.62   39.62    0.00
SO BUILDHGT GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDHGT GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4   12.71   17.11  20.98   24.22   26.72    0.00
SO BUILDWID GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4    0.00    0.00  52.65   42.16   34.02    0.00
SO BUILDWID GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDWID GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4   29.17   29.23  28.41   26.72   24.22    0.00
SO BUILDLEN GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4    0.00    0.00  73.51   76.22  109.04    0.00
SO BUILDLEN GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO BUILDLEN GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4 -101.51 -101.27 -118.50 -118.07 -114.06   0.00
SO XBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4    0.00    0.00 -189.51 -195.02 -227.03   0.00
SO XBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO XBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4    6.03   -9.15  11.54   -6.75  -24.83    0.00
SO YBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4    0.00    0.00  37.31   10.22  -15.36    0.00
SO YBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00
SO YBADJ    GASHEAT4    0.00    0.00   0.00    0.00    0.00    0.00


SO BUILDHGT AUXBOIL     0.00    0.00   0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL    24.40   24.40   0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL    24.40   24.40   0.00    0.00    0.00    0.00
SO BUILDHGT AUXBOIL    39.62   39.62   0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL     0.00   24.40   0.00   24.40   24.40   24.40
SO BUILDHGT AUXBOIL    24.40   24.40   0.00    0.00    0.00    0.00
SO BUILDWID AUXBOIL     0.00    0.00   0.00   24.22   26.72   28.41
SO BUILDWID AUXBOIL    29.23   29.17   0.00   29.17   29.23   28.41
SO BUILDWID AUXBOIL    26.72   24.22   0.00    0.00    0.00    0.00
SO BUILDWID AUXBOIL    44.53   42.16   0.00   24.22   26.72   28.41
SO BUILDWID AUXBOIL     0.00   29.17   0.00   29.17   29.23   28.41
SO BUILDWID AUXBOIL    26.72   24.22   0.00    0.00    0.00    0.00
SO BUILDLEN AUXBOIL     0.00    0.00   0.00   26.72   24.22   20.98
SO BUILDLEN AUXBOIL    17.11   12.72   0.00   12.71   17.11   20.98
SO BUILDLEN AUXBOIL    24.22   26.72   0.00    0.00    0.00    0.00
SO BUILDLEN AUXBOIL   107.19   76.22   0.00   26.72   24.22   20.98
SO BUILDLEN AUXBOIL     0.00   12.71   0.00   12.71   17.11   20.98
SO BUILDLEN AUXBOIL    24.22   26.72   0.00    0.00    0.00    0.00
SO XBADJ    AUXBOIL     0.00    0.00   0.00  -69.35  -70.49 -105.11
SO XBADJ    AUXBOIL  -105.02 -101.75   0.00   42.64   43.64   43.32
SO XBADJ    AUXBOIL    41.69   38.78   0.00    0.00    0.00    0.00
SO XBADJ    AUXBOIL  -281.21 -251.71   0.00   42.63   46.27   48.50
SO XBADJ    AUXBOIL     0.00   48.53   0.00  -55.35  -60.75  -64.31
SO XBADJ    AUXBOIL   -65.91  -65.50   0.00    0.00    0.00    0.00
SO YBADJ    AUXBOIL     0.00    0.00   0.00   18.66    8.66   18.95
SO YBADJ    AUXBOIL     2.24  -14.55   0.00  -22.73  -13.88   -4.60
SO YBADJ    AUXBOIL     4.81   14.08   0.00    0.00    0.00    0.00
SO YBADJ    AUXBOIL    18.83  -11.36   0.00  -18.66   -8.66    1.61
SO YBADJ    AUXBOIL     0.00   21.69   0.00   22.73   13.88    4.60
SO YBADJ    AUXBOIL    -4.81  -14.08   0.00    0.00    0.00    0.00

SO BUILDHGT BLR1       39.62   39.62  39.62   39.62   39.62   39.62
SO BUILDHGT BLR1       46.90   46.90  39.62   46.90   46.90   46.90
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SO BUILDHGT BLR1    46.90  46.90  46.90  39.62   0.00   0.00
SO BUILDHGT BLR1    39.62  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR1    46.90  46.90  39.62  46.90  46.90  46.90
SO BUILDHGT BLR1    46.90  46.90  46.90  39.62   0.00   0.00
SO BUILDWID BLR1    44.53  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR1    37.94  35.20  74.68  35.20  37.94  39.53
SO BUILDWID BLR1    39.92  39.09  37.08  51.17   0.00   0.00
SO BUILDWID BLR1    44.53  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR1    37.94  35.20  74.68  35.20  37.94  39.53
SO BUILDWID BLR1    39.92  39.09  37.08  51.17   0.00   0.00
SO BUILDLEN BLR1   107.19  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR1    33.94  29.77  17.68  29.77  33.94  37.08
SO BUILDLEN BLR1    39.09  39.92  39.53 108.72   0.00   0.00
SO BUILDLEN BLR1   107.19  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR1    33.94  29.77  17.68  29.77  33.94  37.08
SO BUILDLEN BLR1    39.09  39.92  39.53 108.72   0.00   0.00
SO XBADJ    BLR1   -72.17 -76.77 -79.04 -78.91 -76.38 -71.53
SO XBADJ    BLR1   -47.28 -51.27 -44.86 -59.95 -64.37 -66.85
SO XBADJ    BLR1   -67.29 -65.68 -62.08 -56.59   0.00   0.00
SO XBADJ    BLR1   -35.02   0.55   5.53  10.34  14.84  18.88
SO XBADJ    BLR1    13.35  21.51  27.18  30.18  30.44  29.77
SO XBADJ    BLR1    28.19  25.76  22.55 -52.13   0.00   0.00
SO YBADJ    BLR1    37.68  24.26  17.18   9.58   1.68  -6.26
SO YBADJ    BLR1    37.62  31.79 -28.03  17.42   9.33   0.96
SO YBADJ    BLR1    -7.44 -15.62 -23.32 -38.93   0.00   0.00
SO YBADJ    BLR1   -37.68 -24.26 -17.18  -9.58  -1.68   6.26
SO YBADJ    BLR1   -37.62 -31.79  28.03 -17.42  -9.33  -0.96
SO YBADJ    BLR1     7.44  15.62  23.32  38.93   0.00   0.00

SO BUILDHGT BLR2     0.00  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR2    39.62  39.62  39.62  39.62  39.62  46.90
SO BUILDHGT BLR2    46.90  46.90  46.90  39.62  39.62   0.00
SO BUILDHGT BLR2     0.00  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR2    39.62  39.62  39.62  39.62  39.62  46.90
SO BUILDHGT BLR2    46.90  46.90  46.90  39.62  39.62   0.00
SO BUILDWID BLR2     0.00  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR2    76.22  76.62  74.68  76.62  76.22  39.53
SO BUILDWID BLR2    39.92  39.09  37.08  42.16  34.02   0.00
SO BUILDWID BLR2     0.00  42.16  52.65  61.55  68.57  73.51
SO BUILDWID BLR2    76.22  76.62  74.68  76.62  76.22  39.53
SO BUILDWID BLR2    39.92  39.09  37.08  42.16  34.02   0.00
SO BUILDLEN BLR2     0.00  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR2    42.16  30.38  17.68  30.38  42.16  37.08
SO BUILDLEN BLR2    39.09  39.92  39.53  76.22 109.04   0.00
SO BUILDLEN BLR2     0.00  76.22  73.51  68.57  61.55  52.65
SO BUILDLEN BLR2    42.16  30.38  17.68  30.38  42.16  37.08
SO BUILDLEN BLR2    39.09  39.92  39.53  76.22 109.04   0.00
SO XBADJ    BLR2     0.00 -46.33 -50.99 -54.10 -55.56 -55.34
SO XBADJ    BLR2   -53.43 -49.91 -44.86 -51.42 -56.42 -83.04
SO XBADJ    BLR2   -88.11 -90.49 -90.13 -54.53 -81.28   0.00
SO XBADJ    BLR2     0.00 -29.89 -22.52 -14.47  -5.98   2.69
SO XBADJ    BLR2    11.28  19.53  27.18  21.04  14.26  45.96
SO XBADJ    BLR2    49.01  50.58  50.60 -21.69 -27.76   0.00
SO YBADJ    BLR2     0.00  35.34  33.37  30.40  26.49  21.79
SO YBADJ    BLR2    16.42  10.55   4.36  -1.96  -8.22  29.01
SO YBADJ    BLR2    17.37   5.20  -7.13 -32.36 -32.89   0.00
SO YBADJ    BLR2     0.00 -35.34 -33.37 -30.40 -26.49 -21.79
SO YBADJ    BLR2   -16.42 -10.55  -4.36   1.96   8.22 -29.01
SO YBADJ    BLR2   -17.37  -5.20   7.13  32.36  32.89   0.00

SO BUILDHGT BLR3     0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT BLR3    39.62  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR3    39.62  46.90  46.90  39.62  46.90   0.00
SO BUILDHGT BLR3     0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT BLR3    39.62  39.62  39.62  39.62  39.62  39.62
SO BUILDHGT BLR3    39.62  46.90  39.62  39.62  39.62   0.00
SO BUILDWID BLR3     0.00   0.00   0.00   0.00  68.57  73.51
SO BUILDWID BLR3    76.22  76.62  74.68  76.62  76.22  73.51
SO BUILDWID BLR3    68.57  38.33  37.08  42.16  29.77   0.00
SO BUILDWID BLR3     0.00   0.00   0.00   0.00  68.57  73.51
SO BUILDWID BLR3    76.22  76.62  74.68  76.62  76.22  73.51
SO BUILDWID BLR3    68.57  38.33  52.65  42.16  34.02   0.00
SO BUILDLEN BLR3     0.00   0.00   0.00   0.00  61.55  52.65
SO BUILDLEN BLR3    42.16  30.38  17.68  30.38  42.16  52.65
SO BUILDLEN BLR3    61.55  39.92  39.53  76.22  35.20   0.00
SO BUILDLEN BLR3     0.00   0.00   0.00   0.00  61.55  52.65
SO BUILDLEN BLR3    42.16  30.38  17.68  30.38  42.16  52.65
```

```
SO BUILDLEN BLR3     61.55  39.92  73.51  76.22 109.04   0.00
SO XBADJ   BLR3      0.00   0.00   0.00   0.00 -34.35 -38.84
SO XBADJ   BLR3    -42.15 -44.18 -44.86 -57.15 -67.70 -76.20
SO XBADJ   BLR3    -82.38 -115.77 -118.71 -85.54 -113.78  0.00
SO XBADJ   BLR3      0.00   0.00   0.00   0.00 -27.20 -13.81
SO XBADJ   BLR3     -0.01  13.80  27.18  26.77  25.55  23.55
SO XBADJ   BLR3     20.83  75.86  13.61   9.31   4.74   0.00
SO YBADJ   BLR3      0.00   0.00   0.00   0.00  51.77  50.36
SO YBADJ   BLR3     47.43  43.05  37.36  30.54  22.79  14.34
SO YBADJ   BLR3      5.47  26.41   9.37 -21.07 -25.03   0.00
SO YBADJ   BLR3      0.00   0.00   0.00   0.00 -51.77 -50.36
SO YBADJ   BLR3    -47.43 -43.05 -37.36 -30.54 -22.79 -14.34
SO YBADJ   BLR3     -5.47 -26.41  12.51  21.07  27.16   0.00

  SRCGROUP BASE35  OCA1035 OCB1035 OCC1035 OCD1035 OSE1035
  SRCGROUP BASE35  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3
  SRCGROUP BASE95  OCA1095 OCB1095 OCC1095 OCD1095 OSE1095
  SRCGROUP BASE95  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3
  SRCGROUP LD8020  OCA8020 OCB8020 OCC8020 OCD8020 OSE8020
  SRCGROUP LD8020  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3
  SRCGROUP LD8090  OCA8090 OCB8090 OCC8090 OCD8090 OSE8090
  SRCGROUP LD8090  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3
  SRCGROUP LD6020  OCA6020 OCB6020 OCC6020 OCD6020 OSE6020
  SRCGROUP LD6020  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3
  SRCGROUP LD6090  OCA6090 OCB6090 OCC6090 OCD6090 OSE6090
  SRCGROUP LD6090  GASHEAT1-GASHEAT5 AUXBOIL BLR1-BLR3

SO FINISHED
**
***************************************
** AERMOD Receptor Pathway
***************************************
**
**
RE STARTING
  INCLUDED bartow.rou
RE FINISHED
**
***************************************
** AERMOD Meteorology Pathway
***************************************
**
**
ME STARTING
  SURFFILE c:\amodmet\TAMPA_2001.SFC
  PROFFILE c:\amodmet\TAMPA_2001.PFL
  SURFDATA 12842 2001 TAMPA_INT'L_ARPT
  UAIRDATA 12842 2001 RUSKIN_AP
  PROFBASE 19 FEET
ME FINISHED
**
***************************************
** AERMOD Output Pathway
***************************************
**
**
OU STARTING
  RECTABLE ALLAVE FIRST SECOND
OU FINISHED
```

AERBOB RELEASE 020304
AERMOD OUTPUT FILE NUMBER 1 :ccpmfo.o01
AERMOD OUTPUT FILE NUMBER 2 :ccpmfo.o02
AERMOD OUTPUT FILE NUMBER 3 :ccpmfo.o03
AERMOD OUTPUT FILE NUMBER 4 :ccpmfo.o04
AERMOD OUTPUT FILE NUMBER 5 :ccpmfo.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, PM10 SIG, FUEL OIL 7/22/06
Second title for last output file is: TAMPA/TAMPA 2001-2005

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE35					
Annual					
	2001	0.55	342733.	3082404.	01123124
	2002	0.49	341984.	3082747.	02123124
	2003	0.56	342454.	3083071.	03123124
	2004	0.56	342750.	3082350.	04123124
	2005	0.55	342733.	3082404.	05123124
HIGH 24-Hour					
	2001	16.29	342850.	3081950.	01030524
	2002	13.87	342450.	3081950.	02022724
	2003	12.02	342850.	3082050.	03041024
	2004	21.73	342250.	3082050.	04090524
	2005	15.41	341850.	3082750.	05070924
HSH 24-Hour					
	2001	10.63	342750.	3081850.	01030624
	2002	10.73	341650.	3082550.	02040724
	2003	8.79	342750.	3081950.	03121724
	2004	18.02	342350.	3082050.	04090524
	2005	14.51	341850.	3082750.	05071024
SOURCE GROUP ID: BASE95					
Annual					
	2001	0.63	342750.	3082350.	01123124
	2002	0.60	341984.	3082747.	02123124
	2003	0.63	342454.	3083071.	03123124
	2004	0.64	342750.	3082350.	04123124
	2005	0.63	342750.	3082350.	05123124
HIGH 24-Hour					
	2001	17.87	342850.	3081950.	01030524
	2002	14.78	342450.	3081950.	02022724
	2003	13.31	342850.	3082050.	03041024
	2004	24.20	342250.	3082050.	04090524
	2005	16.81	341850.	3082750.	05070924
HSH 24-Hour					
	2001	11.88	342750.	3081950.	01030624
	2002	11.85	341750.	3082550.	02030124
	2003	9.58	342750.	3081950.	03121724
	2004	20.43	342350.	3082050.	04090524
	2005	15.64	341850.	3082750.	05071024
SOURCE GROUP ID: LD8020					
Annual					
	2001	0.63	342750.	3082350.	01123124
	2002	0.59	341984.	3082701.	02123124
	2003	0.63	342454.	3083071.	03123124
	2004	0.64	342750.	3082350.	04123124
	2005	0.63	342750.	3082350.	05123124
HIGH 24-Hour					
	2001	17.75	342850.	3081950.	01030524
	2002	14.62	342450.	3081950.	02022724
	2003	13.38	342850.	3082050.	03041024
	2004	24.01	342250.	3082050.	04090524
	2005	16.67	341850.	3082750.	05070924
HSH 24-Hour					
	2001	11.81	342750.	3081950.	01030624
	2002	11.84	341750.	3082550.	02030124
	2003	9.52	342750.	3081950.	03121724
	2004	20.30	342350.	3082050.	04090524
	2005	15.54	341850.	3082750.	05071024
SOURCE GROUP ID: LD8090					
Annual					
	2001	0.80	342750.	3082350.	01123124
	2002	0.80	341984.	3082701.	02123124
	2003	0.76	342454.	3083071.	03123124
	2004	0.81	342750.	3082350.	04123124
	2005	0.81	342750.	3082350.	05123124
HIGH 24-Hour					

	2001	21.09	342750.	3082050.	01030524
	2002	17.67	342450.	3082050.	02022724
	2003	15.76	342850.	3082050.	03041024
	2004	27.80	342250.	3082050.	04090524
	2005	20.08	341850.	3082650.	05070924
HSH 24-Hour					
	2001	13.82	342650.	3082050.	01030624
	2002	14.38	341750.	3082550.	02040724
	2003	11.20	342450.	3081950.	03112824
	2004	22.59	342350.	3082150.	04090524
	2005	17.74	341850.	3082750.	05071024
SOURCE GROUP ID: LD6020					
Annual					
	2001	0.70	342750.	3082350.	01123124
	2002	0.68	341984.	3082701.	02123124
	2003	0.68	342454.	3083071.	03123124
	2004	0.71	342750.	3082350.	04123124
	2005	0.70	342750.	3082350.	05123124
HIGH 24-Hour					
	2001	18.98	342850.	3081950.	01030524
	2002	15.80	342450.	3082050.	02022724
	2003	14.35	342850.	3082050.	03041024
	2004	25.61	342250.	3082050.	04090524
	2005	18.07	342250.	3082050.	05102424
HSH 24-Hour					
	2001	12.56	342650.	3081950.	01030524
	2002	13.04	341750.	3082550.	02030124
	2003	10.17	342450.	3081950.	03112824
	2004	21.23	342350.	3082050.	04092624
	2005	16.34	341850.	3082750.	05071024
SOURCE GROUP ID: LD6090					
Annual					
	2001	0.85	342750.	3082350.	01123124
	2002	0.85	341984.	3082701.	02123124
	2003	0.80	341984.	3082701.	03123124
	2004	0.86	342750.	3082350.	04123124
	2005	0.85	342750.	3082350.	05123124
HIGH 24-Hour					
	2001	22.08	342750.	3082050.	01030524
	2002	18.55	342450.	3082050.	02022724
	2003	16.52	342850.	3082050.	03041024
	2004	28.49	342250.	3082050.	04090524
	2005	21.13	341850.	3082650.	05070924
HSH 24-Hour					
	2001	14.76	342650.	3081950.	01030524
	2002	14.91	341750.	3082550.	02040724
	2003	11.76	342450.	3081950.	03112824
	2004	24.37	342350.	3082150.	04090524
	2005	18.36	341850.	3082750.	05071024

All receptor computations reported with respect to a user-specified origin

GRID	0.00	0.00
DISCRETE	0.00	0.00

```
CO STARTING
   TITLEONE 2001 BARTOW REPOWERING, AERMOD, SO2 BASE35, FUEL OIL    7/22/06
   TITLETWO TAMPA/TAMPA 2001-2005
   MODELOPT DFAULT CONC
   AVERTIME PERIOD 24 3
   POLLUTID SO2
   RUNORNOT RUN
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


   LOCATION OCA1035 POINT 342197.530 3082436.900 0.000
   LOCATION OCB1035 POINT 342238.650 3082436.920 0.000
   LOCATION OCC1035 POINT 342333.150 3082436.920 0.000
   LOCATION OCD1035 POINT 342374.290 3082436.940 0.000
   LOCATION OSE1035 POINT 342140.890 3082493.580 0.000
   LOCATION OCA1095 POINT 342197.530 3082436.900 0.000
   LOCATION OCB1095 POINT 342238.650 3082436.920 0.000
   LOCATION OCC1095 POINT 342333.150 3082436.920 0.000
   LOCATION OCD1095 POINT 342374.290 3082436.940 0.000
   LOCATION OSE1095 POINT 342140.890 3082493.580 0.000
   LOCATION OCA8020 POINT 342197.530 3082436.900 0.000
   LOCATION OCB8020 POINT 342238.650 3082436.920 0.000
   LOCATION OCC8020 POINT 342333.150 3082436.920 0.000
   LOCATION OCD8020 POINT 342374.290 3082436.940 0.000
   LOCATION OSE8020 POINT 342140.890 3082493.580 0.000
   LOCATION OCA8090 POINT 342197.530 3082436.900 0.000
   LOCATION OCB8090 POINT 342238.650 3082436.920 0.000
   LOCATION OCC8090 POINT 342333.150 3082436.920 0.000
   LOCATION OCD8090 POINT 342374.290 3082436.940 0.000
   LOCATION OSE8090 POINT 342140.890 3082493.580 0.000
   LOCATION OCA6020 POINT 342197.530 3082436.900 0.000
   LOCATION OCB6020 POINT 342238.650 3082436.920 0.000
   LOCATION OCC6020 POINT 342333.150 3082436.920 0.000
   LOCATION OCD6020 POINT 342374.290 3082436.940 0.000
   LOCATION OSE6020 POINT 342140.890 3082493.580 0.000
   LOCATION OCA6090 POINT 342197.530 3082436.900 0.000
   LOCATION OCB6090 POINT 342238.650 3082436.920 0.000
   LOCATION OCC6090 POINT 342333.150 3082436.920 0.000
   LOCATION OCD6090 POINT 342374.290 3082436.940 0.000
   LOCATION OSE6090 POINT 342140.890 3082493.580 0.000
   LOCATION GASHEAT1 POINT 342217.500 3082540.000 0.000
   LOCATION GASHEAT5 POINT 342161.790 3082540.000 0.000
   LOCATION GASHEAT2 POINT 342259.810 3082540.000 0.000
   LOCATION GASHEAT3 POINT 342353.350 3082540.000 0.000
   LOCATION GASHEAT4 POINT 342395.440 3082540.000 0.000
   LOCATION  AUXBOIL POINT 342289.000 3082486.340 0.000

** Source Parameters **
   SRCPARAM OCA1035 12.65 36.6 382.0 24.7 5.49
   SRCPARAM OCB1035 12.65 36.6 382.0 24.7 5.49
   SRCPARAM OCC1035 12.65 36.6 382.0 24.7 5.49
   SRCPARAM OCD1035 12.65 36.6 382.0 24.7 5.49
   SRCPARAM OSE1035 12.65 36.6 828.0 35.8 6.71

   SRCPARAM OCA1095 11.28 36.6 382.0 22.4 5.49
   SRCPARAM OCB1095 11.28 36.6 382.0 22.4 5.49
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   SRCPARAM OCC1095 11.28 36.6 382.0 22.4 5.49
   SRCPARAM OCD1095 11.28 36.6 382.0 22.4 5.49
   SRCPARAM OSE1095 11.28 36.6 851.0 33.3 6.71

   SRCPARAM OCA8020 10.07 36.6 382.0 22.0 5.49
   SRCPARAM OCB8020 10.07 36.6 382.0 22.0 5.49
   SRCPARAM OCC8020 10.07 36.6 382.0 22.0 5.49
   SRCPARAM OCD8020 10.07 36.6 382.0 22.0 5.49
   SRCPARAM OSE8020 10.07 36.6 878.0 33.9 6.71

   SRCPARAM OCA8090  8.36 36.6 382.0 18.7 5.49
   SRCPARAM OCB8090  8.36 36.6 382.0 18.7 5.49
   SRCPARAM OCC8090  8.36 36.6 382.0 18.7 5.49
   SRCPARAM OCD8090  8.36 36.6 382.0 18.7 5.49
   SRCPARAM OSE8090  8.36 36.6 905.0 29.7 6.71

   SRCPARAM OCA6020  8.49 36.6 382.0 20.2 5.49
   SRCPARAM OCB6020  8.49 36.6 382.0 20.2 5.49
   SRCPARAM OCC6020  8.49 36.6 382.0 20.2 5.49
   SRCPARAM OCD6020  8.49 36.6 382.0 20.2 5.49
   SRCPARAM OSE6020  8.49 36.6 905.0 32.0 6.71

   SRCPARAM OCA6090  7.24 36.6 382.0 17.7 5.49
   SRCPARAM OCB6090  7.24 36.6 382.0 17.7 5.49
   SRCPARAM OCC6090  7.24 36.6 382.0 17.7 5.49
   SRCPARAM OCD6090  7.24 36.6 382.0 17.7 5.49
   SRCPARAM OSE6090  7.24 36.6 922.0 28.6 6.71

   SRCPARAM GASHEAT1 0.002 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT5 0.002 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT2 0.002 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT3 0.002 18.3 533.0  7.92 0.61
   SRCPARAM GASHEAT4 0.002 18.3 533.0  7.92 0.61
   SRCPARAM  AUXBOIL 0.069 18.3 420.0 24.69 0.84

** Building Downwash **
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095     29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCA1035-OCA8095     29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095     17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCA1035-OCA8095     17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCA1035-OCA8095     3.69   2.83   1.88   0.88  -0.15  -1.17
SO XBADJ    OCA1035-OCA8095    -2.16  -3.08  -3.91  -9.53 -14.85 -19.72
SO XBADJ    OCA1035-OCA8095   -23.99 -27.53 -30.24 -32.03 -32.84 -32.66
SO XBADJ    OCA1035-OCA8095   -32.86 -32.06 -30.29 -27.60 -24.07 -19.81
SO XBADJ    OCA1035-OCA8095   -14.95  -9.63  -4.02  -3.19  -2.26  -1.27
SO XBADJ    OCA1035-OCA8095    -0.23   0.81   1.83   2.79   3.67   4.44
SO YBADJ    OCA1035-OCA8095     3.17   6.29   9.23  11.88  14.17  16.03
SO YBADJ    OCA1035-OCA8095    17.41  18.26  18.55  18.27  17.45  16.09
SO YBADJ    OCA1035-OCA8095    14.24  11.96   9.32   6.39   3.27   0.05
SO YBADJ    OCA1035-OCA8095    -3.17  -6.29  -9.23 -11.88 -14.17 -16.03
SO YBADJ    OCA1035-OCA8095   -17.41 -18.26 -18.55 -18.27 -17.45 -16.09
SO YBADJ    OCA1035-OCA8095   -14.24 -11.96  -9.32  -6.39  -3.27  -0.05


SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCB1035-OCB8095     12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095     29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095     26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCB1035-OCB8095     12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095     29.23  29.17  28.22  29.17  29.23  28.41
```

```
SO BUILDWID OCB1035-OCB8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCB1035-OCB8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095   17.11  12.72   7.94  12.72  17.11  20.98
SO BUILDLEN OCB1035-OCB8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCB1035-OCB8095    3.67   2.82   1.87   0.88  -0.15  -1.17
SO XBADJ    OCB1035-OCB8095   -2.15 -43.58 -45.03 -50.02 -53.48 -55.32
SO XBADJ    OCB1035-OCB8095  -55.48 -53.95 -30.21 -32.00 -32.82 -32.64
SO XBADJ    OCB1035-OCB8095  -32.84 -32.05 -30.28 -27.60 -24.07 -19.81
SO XBADJ    OCB1035-OCB8095  -14.95  30.87  37.10  37.30  36.37  34.34
SO XBADJ    OCB1035-OCB8095   31.26  27.23   1.81   2.77   3.65   4.42
SO YBADJ    OCB1035-OCB8095    3.15   6.27   9.20  11.86  14.15  16.01
SO YBADJ    OCB1035-OCB8095   17.39  25.38  18.53  11.11   3.36  -4.49
SO YBADJ    OCB1035-OCB8095  -12.20 -19.55   9.32   6.40   3.28   0.07
SO YBADJ    OCB1035-OCB8095   -3.15  -6.27  -9.20 -11.86 -14.15 -16.01
SO YBADJ    OCB1035-OCB8095  -17.39 -25.38 -18.53 -11.11  -3.36   4.49
SO YBADJ    OCB1035-OCB8095   12.20  19.55  -9.32  -6.40  -3.28  -0.07

SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCC1035-OCC8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCC1035-OCC8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCC1035-OCC8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCC1035-OCC8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCC1035-OCC8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCC1035-OCC8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCC1035-OCC8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCC1035-OCC8095    3.69   2.85   1.92   0.93  -0.08  -1.10
SO XBADJ    OCC1035-OCC8095   -2.07  -2.99 -98.40 -102.57 -103.63 -19.62
SO XBADJ    OCC1035-OCC8095  -23.90 -27.45 -30.17 -31.97 -32.80 -32.64
SO XBADJ    OCC1035-OCC8095  -32.86 -32.08 -30.32 -27.65 -24.14 -19.89
SO XBADJ    OCC1035-OCC8095  -15.03  -9.73  -4.12  -3.29  -2.36  -1.36
SO XBADJ    OCC1035-OCC8095   -0.32   0.73   1.76   2.74   3.63   4.42
SO YBADJ    OCC1035-OCC8095    3.07   6.19   9.13  11.79  14.09  15.97
SO YBADJ    OCC1035-OCC8095   17.36  18.22  18.53   1.85 -14.89  16.12
SO YBADJ    OCC1035-OCC8095   14.29  12.03   9.40   6.48   3.37   0.15
SO YBADJ    OCC1035-OCC8095   -3.07  -6.19  -9.13 -11.79 -14.09 -15.97
SO YBADJ    OCC1035-OCC8095  -17.36 -18.22 -18.53 -18.27 -17.46 -16.12
SO YBADJ    OCC1035-OCC8095  -14.29 -12.03  -9.40  -6.48  -3.37  -0.15

SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCD1035-OCD8095   24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDWID OCD1035-OCD8095   12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCD1035-OCD8095   29.23  29.17  28.22  29.17  29.23  28.41
SO BUILDWID OCD1035-OCD8095   26.72  24.22  20.98  17.11  12.71   7.94
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.93  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO BUILDLEN OCD1035-OCD8095   29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCD1035-OCD8095   17.11  12.71   7.94  12.71  17.11  20.98
SO BUILDLEN OCD1035-OCD8095   24.22  26.72  28.41  29.23  29.17  28.22
SO XBADJ    OCD1035-OCD8095    3.66   2.81   1.88   0.89  -0.13  -1.14
SO XBADJ    OCD1035-OCD8095   -2.12 -43.51 -44.95 -49.93 -53.40 -55.24
SO XBADJ    OCD1035-OCD8095  -55.40 -53.88 -30.17 -31.97 -32.79 -32.62
SO XBADJ    OCD1035-OCD8095  -32.83 -32.05 -30.29 -27.61 -24.09 -19.84
SO XBADJ    OCD1035-OCD8095  -14.99  30.79  37.02  37.22  36.29  34.26
SO XBADJ    OCD1035-OCD8095   31.18  27.16   1.77   2.74   3.62   4.40
SO YBADJ    OCD1035-OCD8095    3.10   6.22   9.15  11.81  14.10  15.97
SO YBADJ    OCD1035-OCD8095   17.35  25.34  18.51  11.11   3.37  -4.47
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SO YBADJ    OCD1035-OCD8095    -12.17 -19.50   9.35   6.44   3.33   0.11
SO YBADJ    OCD1035-OCD8095     -3.10  -6.22  -9.15 -11.81 -14.10 -15.97
SO YBADJ    OCD1035-OCD8095    -17.35 -25.34 -18.51 -11.11  -3.37   4.47
SO YBADJ    OCD1035-OCD8095     12.17  19.50  -9.35  -6.44  -3.33  -0.11


SO BUILDHGT OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OSE1035-OSE8095     0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT OSE1035-OSE8095    24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OSE1035-OSE8095     0.00   0.00   0.00  29.17  29.23  28.41
SO BUILDWID OSE1035-OSE8095    26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OSE1035-OSE8095     0.00   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN OSE1035-OSE8095    24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OSE1035-OSE8095     0.00   0.00   0.00-109.32 -74.87 -78.66
SO XBADJ    OSE1035-OSE8095   -80.05 -79.01   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095     0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OSE1035-OSE8095     0.00   0.00   0.00  20.57  16.44   4.68
SO YBADJ    OSE1035-OSE8095    -7.23 -18.92   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00  52.65  61.55  68.57   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT1  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00  73.51  68.57  61.55   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT1 -101.31 -100.88   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00 -234.42 -235.97 -230.35   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00 -101.33 -101.54   0.00
SO YBADJ    GASHEAT1   4.93 -10.20   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00  40.47   5.54 -29.57   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   8.98  -6.21   0.00


SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT5  24.40  24.40  24.40  24.40   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDWID GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT5  26.72  24.22  20.98  17.11   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT5  24.22  26.72  28.41  29.23   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT5 -125.39 -127.58 -105.33 -106.31   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT5  15.32  -4.58  11.28  -4.72   0.00   0.00

SO BUILDHGT GASHEAT2  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00  39.62  39.62  39.62   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2   0.00  42.16  52.65  61.55   0.00   0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT2  26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2   0.00  76.22  73.51  68.57   0.00   0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT2  24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2   0.00 -211.27 -213.26 -208.77   0.00   0.00
SO XBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT2 -122.76 -125.37   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   6.09  -9.10  11.61  -6.68 -24.77   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2   0.00  34.42   3.83 -26.88   0.00   0.00
SO YBADJ    GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT2  17.53  -1.95   0.00   0.00   0.00   0.00

SO BUILDHGT GASHEAT3  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00  39.62  39.62
SO BUILDHGT GASHEAT3  39.62   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT3   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT3  12.71  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00  32.49  26.52
SO BUILDWID GASHEAT3  32.49   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT3   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT3  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00 109.04 106.05
SO BUILDLEN GASHEAT3 107.19   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT3   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT3 -101.34 -100.93   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00 -219.73 -219.65
SO XBADJ    GASHEAT3 -217.19   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT3   0.00   0.00   0.00 -101.27 -101.51   0.00
SO YBADJ    GASHEAT3   5.06 -10.08   0.00   0.00   0.00   0.00
```

```
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00  26.09  -6.39
SO YBADJ    GASHEAT3 -35.23   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT3   0.00   0.00   0.00   9.14  -6.05   0.00


SO BUILDHGT GASHEAT4  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4  12.71  17.11  20.98  24.22  26.72   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00  52.65  42.16  34.02   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4  29.17  29.23  28.41  26.72  24.22   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00  73.51  76.22 109.04   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4 -101.51 -101.27 -118.50 -118.07 -114.06   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00 -189.51 -195.02 -227.03   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   6.03  -9.15  11.54  -6.75 -24.83   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00  37.31  10.22 -15.36   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT4   0.00   0.00   0.00   0.00   0.00   0.00


SO BUILDHGT AUXBOIL    0.00   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT AUXBOIL   39.62  39.62   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL    0.00  24.40   0.00  24.40  24.40  24.40
SO BUILDHGT AUXBOIL   24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL    0.00   0.00   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL   29.23  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDWID AUXBOIL   44.53  42.16   0.00  24.22  26.72  28.41
SO BUILDWID AUXBOIL    0.00  29.17   0.00  29.17  29.23  28.41
SO BUILDWID AUXBOIL   26.72  24.22   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL    0.00   0.00   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL   17.11  12.72   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO BUILDLEN AUXBOIL  107.19  76.22   0.00  26.72  24.22  20.98
SO BUILDLEN AUXBOIL    0.00  12.71   0.00  12.71  17.11  20.98
SO BUILDLEN AUXBOIL   24.22  26.72   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL    0.00   0.00   0.00 -69.35 -70.49 -105.11
SO XBADJ    AUXBOIL -105.02 -101.75  0.00  42.64  43.64  43.32
SO XBADJ    AUXBOIL   41.69  38.78   0.00   0.00   0.00   0.00
SO XBADJ    AUXBOIL -281.21 -251.71  0.00  42.63  46.27  48.50
SO XBADJ    AUXBOIL    0.00  48.53   0.00 -55.35 -60.75 -64.31
SO XBADJ    AUXBOIL  -65.91 -65.50   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL    0.00   0.00   0.00  18.66   8.66  18.95
SO YBADJ    AUXBOIL    2.24 -14.55   0.00 -22.73 -13.88  -4.60
SO YBADJ    AUXBOIL    4.81  14.08   0.00   0.00   0.00   0.00
SO YBADJ    AUXBOIL   18.83 -11.36   0.00 -18.66  -8.66   1.61
SO YBADJ    AUXBOIL    0.00  21.69   0.00  22.73  13.88   4.60
SO YBADJ    AUXBOIL   -4.81 -14.08   0.00   0.00   0.00   0.00

   SRCGROUP BASE35  OCA1035 OCB1035 OCC1035 OCD1035 OSE1035
   SRCGROUP BASE35  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP BASE95  OCA1095 OCB1095 OCC1095 OCD1095 OSE1095
   SRCGROUP BASE95  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD8020  OCA8020 OCB8020 OCC8020 OCD8020 OSE8020
   SRCGROUP LD8020  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD8090  OCA8090 OCB8090 OCC8090 OCD8090 OSE8090
   SRCGROUP LD8090  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD6020  OCA6020 OCB6020 OCC6020 OCD6020 OSE6020
```

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   SRCGROUP LD6020  GASHEAT1-GASHEAT5 AUXBOIL
   SRCGROUP LD6090  OCA6090 OCB6090 OCC6090 OCD6090 OSE6090
   SRCGROUP LD6090  GASHEAT1-GASHEAT5 AUXBOIL

SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED bartow.rou
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE c:\amodmet\TAMPA_2001.SFC
   PROFFILE c:\amodmet\TAMPA_2001.PFL
   SURFDATA 12842 2001 TAMPA_INT'L_ARPT
   UAIRDATA 12842 2001 RUSKIN_AP
   PROFBASE 19 FEET
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST SECOND
OU FINISHED
```

AERBOB RELEASE 020304
AERMOD OUTPUT FILE NUMBER 1 :ccso2fo.o01
AERMOD OUTPUT FILE NUMBER 2 :ccso2fo.o02
AERMOD OUTPUT FILE NUMBER 3 :ccso2fo.o03
AERMOD OUTPUT FILE NUMBER 4 :ccso2fo.o04
AERMOD OUTPUT FILE NUMBER 5 :ccso2fo.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, SO2 BASE35, FUEL OIL 7/22/06
Second title for last output file is: TAMPA/TAMPA 2001-2005

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE35					
Annual					
	2001	1.86	341750.	3082250.	01123124
	2002	1.77	341750.	3082350.	02123124
	2003	1.42	342050.	3081950.	03123124
	2004	1.56	341750.	3082350.	04123124
	2005	1.94	341850.	3082050.	05123124
HIGH 24-Hour					
	2001	25.18	342050.	3081750.	01110524
	2002	20.40	342550.	3081850.	02022724
	2003	23.86	342050.	3081750.	03112924
	2004	33.14	342250.	3082050.	04090524
	2005	26.71	341750.	3082750.	05070924
HSH 24-Hour					
	2001	18.41	341950.	3081750.	01092924
	2002	17.58	341550.	3082650.	02040724
	2003	18.92	341850.	3081850.	03111024
	2004	28.93	342250.	3081950.	04092524
	2005	18.90	341750.	3082850.	05071024
HIGH 3-Hour					
	2001	56.48	342750.	3081950.	01091503
	2002	66.90	341750.	3082150.	02120921
	2003	53.38	342150.	3081750.	03112906
	2004	81.65	342250.	3082050.	04092524
	2005	84.15	342150.	3082050.	05102406
HSH 3-Hour					
	2001	44.63	341950.	3081850.	01101709
	2002	48.57	342450.	3081950.	02022706
	2003	47.20	341950.	3081750.	03112903
	2004	79.90	342250.	3082050.	04090506
	2005	65.39	341750.	3082750.	05071003
SOURCE GROUP ID: BASE95					
Annual					
	2001	1.83	341750.	3082250.	01123124
	2002	1.74	341750.	3082350.	02123124
	2003	1.42	342050.	3081950.	03123124
	2004	1.54	341750.	3082350.	04123124
	2005	1.93	341850.	3082050.	05123124
HIGH 24-Hour					
	2001	24.83	342050.	3081750.	01110524
	2002	19.38	342550.	3081850.	02022724
	2003	23.02	342050.	3081850.	03112924
	2004	33.24	342250.	3082050.	04090524
	2005	25.60	341750.	3082750.	05070924
HSH 24-Hour					
	2001	18.04	342050.	3081850.	01041824
	2002	17.15	341550.	3082650.	02040724
	2003	18.85	341850.	3081850.	03111024
	2004	28.20	342250.	3081950.	04092524
	2005	18.50	341650.	3082650.	05061024
HIGH 3-Hour					
	2001	54.89	342150.	3082050.	01091409
	2002	63.60	341750.	3082150.	02120921
	2003	50.98	342050.	3081750.	03112903
	2004	80.33	342250.	3082050.	04092524
	2005	81.31	342150.	3082050.	05102406
HSH 3-Hour					
	2001	43.53	341950.	3081850.	01101709
	2002	45.82	342450.	3081950.	02022706
	2003	45.81	342150.	3081850.	03112903
	2004	78.12	342250.	3082050.	04090506
	2005	63.17	341750.	3082750.	05071003
SOURCE GROUP ID: LD8020					
Annual					
	2001	1.67	341750.	3082250.	01123124

	2002	1.58	341750.	3082350.	02123124
	2003	1.29	342050.	3081950.	03123124
	2004	1.40	341750.	3082350.	04123124
	2005	1.76	341850.	3082050.	05123124
HIGH 24-Hour					
	2001	22.55	342050.	3081750.	01110524
	2002	17.55	342550.	3081950.	02022724
	2003	20.86	342050.	3081850.	03112924
	2004	30.17	342250.	3082050.	04090524
	2005	23.16	341750.	3082750.	05070924
HSH 24-Hour					
	2001	16.42	342050.	3081850.	01041824
	2002	15.53	341550.	3082650.	02040724
	2003	17.15	341850.	3081850.	03111024
	2004	25.56	342250.	3081950.	04092524
	2005	16.83	341650.	3082650.	05061024
HIGH 3-Hour					
	2001	49.77	342150.	3082050.	01091409
	2002	57.42	341750.	3082150.	02120921
	2003	46.22	342050.	3081850.	03112903
	2004	72.81	342250.	3082050.	04092524
	2005	73.41	342150.	3082050.	05102406
HSH 3-Hour					
	2001	39.47	341950.	3081850.	01101709
	2002	41.40	342450.	3081950.	02022706
	2003	41.58	342150.	3081850.	03112903
	2004	70.77	342250.	3082050.	04090506
	2005	57.17	341750.	3082750.	05071003
SOURCE GROUP ID: LD8090					
Annual					
	2001	1.63	341850.	3082250.	01123124
	2002	1.55	341850.	3082350.	02123124
	2003	1.28	342050.	3081950.	03123124
	2004	1.36	341750.	3082350.	04123124
	2005	1.73	341850.	3082050.	05123124
HIGH 24-Hour					
	2001	21.80	342050.	3081750.	01110524
	2002	17.30	342450.	3082050.	02022724
	2003	19.77	342050.	3081850.	03112924
	2004	29.45	342250.	3082050.	04090524
	2005	22.27	342250.	3082050.	05102424
HSH 24-Hour					
	2001	16.07	342050.	3081950.	01092924
	2002	15.22	341650.	3082550.	02030124
	2003	16.91	341850.	3081850.	03110924
	2004	24.36	342250.	3081950.	04092524
	2005	16.25	341650.	3082650.	05070924
HIGH 3-Hour					
	2001	47.07	342150.	3082050.	01091409
	2002	54.78	341850.	3082250.	02120921
	2003	43.88	342050.	3081850.	03112903
	2004	68.72	342250.	3082050.	04092524
	2005	67.70	342150.	3082050.	05102406
HSH 3-Hour					
	2001	37.11	341950.	3081850.	01101709
	2002	41.58	342450.	3082050.	02022709
	2003	39.80	342150.	3081850.	03112903
	2004	66.10	342250.	3082050.	04090506
	2005	53.21	341750.	3082750.	05071003
SOURCE GROUP ID: LD6020					
Annual					
	2001	1.53	341850.	3082250.	01123124
	2002	1.46	341850.	3082350.	02123124
	2003	1.20	342050.	3081950.	03123124
	2004	1.29	341750.	3082350.	04123124
	2005	1.63	341850.	3082050.	05123124
HIGH 24-Hour					
	2001	20.62	342050.	3081750.	01110524
	2002	16.15	342550.	3081950.	02022724
	2003	18.87	342050.	3081850.	03112924
	2004	27.78	342250.	3082050.	04090524
	2005	20.83	341750.	3082750.	05070924
HSH 24-Hour					
	2001	15.16	342050.	3081950.	01092924
	2002	14.28	341650.	3082550.	02030124
	2003	15.89	341850.	3081850.	03111024
	2004	23.23	342250.	3081950.	04092524
	2005	15.48	341650.	3082650.	05061024
HIGH 3-Hour					

	2001	45.08	342150.	3082050.	01091409
	2002	51.47	341750.	3082150.	02120921
	2003	41.79	342050.	3081850.	03112903
	2004	65.92	342250.	3082050.	04092524
	2005	65.57	342150.	3082050.	05102406
HSH 3-Hour					
	2001	35.65	341950.	3081850.	01101709
	2002	37.35	342450.	3082050.	02022709
	2003	37.73	342150.	3081850.	03112903
	2004	63.74	342250.	3082050.	04090506
	2005	51.23	341750.	3082750.	05071003
SOURCE GROUP ID: LD6090					
Annual					
	2001	1.50	341850.	3082250.	01123124
	2002	1.43	341850.	3082350.	02123124
	2003	1.18	342050.	3081950.	03123124
	2004	1.25	341850.	3082350.	04123124
	2005	1.59	341950.	3082050.	05123124
HIGH 24-Hour					
	2001	19.88	342050.	3081750.	01110524
	2002	16.08	342450.	3082050.	02022724
	2003	18.23	342150.	3081950.	03112924
	2004	26.70	342250.	3082050.	04090524
	2005	20.48	341850.	3082650.	05070924
HSH 24-Hour					
	2001	14.76	341950.	3081850.	01110524
	2002	14.04	341750.	3082550.	02030124
	2003	15.34	341850.	3081850.	03110924
	2004	22.05	342250.	3081950.	04092524
	2005	14.88	341850.	3082750.	05071024
HIGH 3-Hour					
	2001	42.34	342150.	3082050.	01091409
	2002	50.72	341850.	3082250.	02120921
	2003	39.70	342050.	3081850.	03112903
	2004	61.71	342250.	3082050.	04092524
	2005	60.98	342150.	3082150.	05102406
HSH 3-Hour					
	2001	33.39	341950.	3081850.	01101709
	2002	37.83	342450.	3082050.	02022706
	2003	36.50	342150.	3081950.	03112906
	2004	59.17	342250.	3082050.	04090506
	2005	48.16	341750.	3082750.	05071003

All receptor computations reported with respect to a user-specified origin

GRID 0.00 0.00

DISCRETE 0.00 0.00

```
CO STARTING
   TITLEONE 2001 BARTOW REPOWERING, AERMOD, PHASE 1,10 G/S EM 7/22/06
   TITLETWO TAMPA/TAMPA 2001-2005, 2 SIMPLE-CYCLE CTS ONLY ON OIL
   MODELOPT DFAULT CONC
   AVERTIME PERIOD 24 8 3 1
   POLLUTID GEN
   RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


   LOCATION OSA1035 POINT 342197.540 3082493.580 0.000
   LOCATION OSB1035 POINT 342238.670 3082493.580 0.000
   LOCATION OSA1095 POINT 342197.540 3082493.580 0.000
   LOCATION OSB1095 POINT 342238.670 3082493.580 0.000
   LOCATION OSA8020 POINT 342197.540 3082493.580 0.000
   LOCATION OSB8020 POINT 342238.670 3082493.580 0.000
   LOCATION OSA8090 POINT 342197.540 3082493.580 0.000
   LOCATION OSB8090 POINT 342238.670 3082493.580 0.000
   LOCATION OSA6020 POINT 342197.540 3082493.580 0.000
   LOCATION OSB6020 POINT 342238.670 3082493.580 0.000
   LOCATION OSA6090 POINT 342197.540 3082493.580 0.000
   LOCATION OSB6090 POINT 342238.670 3082493.580 0.000

** Source Parameters **
   SRCPARAM OSA1035  5.00 36.6 828.0 35.8 6.71
   SRCPARAM OSB1035  5.00 36.6 828.0 35.8 6.71
   SRCPARAM OSA1095  5.00 36.6 851.0 33.3 6.71
   SRCPARAM OSB1095  5.00 36.6 851.0 33.3 6.71
   SRCPARAM OSA8020  5.00 36.6 878.0 33.9 6.71
   SRCPARAM OSB8020  5.00 36.6 878.0 33.9 6.71
   SRCPARAM OSA8090  5.00 36.6 905.0 29.7 6.71
   SRCPARAM OSB8090  5.00 36.6 905.0 29.7 6.71
   SRCPARAM OSA6020  5.00 36.6 905.0 32.0 6.71
   SRCPARAM OSB6020  5.00 36.6 905.0 32.0 6.71
   SRCPARAM OSA6090  5.00 36.6 922.0 28.6 6.71
   SRCPARAM OSB6090  5.00 36.6 922.0 28.6 6.71

** Building Downwash **
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40   0.00   0.00   0.00
SO BUILDHGT OCA1035-OCA8095      0.00   0.00   0.00   0.00  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40   0.00   0.00   0.00
SO BUILDHGT OCA1035-OCA8095      0.00   0.00   0.00   0.00  24.40  24.40
SO BUILDHGT OCA1035-OCA8095     24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98   0.00   0.00   0.00
SO BUILDWID OCA1035-OCA8095      0.00   0.00   0.00   0.00  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   0.00
SO BUILDWID OCA1035-OCA8095     12.72  17.11  20.98   0.00   0.00   0.00
SO BUILDWID OCA1035-OCA8095      0.00   0.00   0.00   0.00  29.23  28.41
SO BUILDWID OCA1035-OCA8095     26.72  24.22  20.98  17.11  12.72   7.94
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41   0.00   0.00   0.00
SO BUILDLEN OCA1035-OCA8095      0.00   0.00   0.00   0.00  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17   0.00
SO BUILDLEN OCA1035-OCA8095     29.17  29.23  28.41   0.00   0.00   0.00
SO BUILDLEN OCA1035-OCA8095      0.00   0.00   0.00   0.00  17.11  20.98
SO BUILDLEN OCA1035-OCA8095     24.22  26.72  28.41  29.23  29.17  28.22
```

```
SO XBADJ    OCA1035-OCA8095   -52.13 -50.44 -47.21   0.00   0.00   0.00
SO XBADJ    OCA1035-OCA8095     0.00   0.00   0.00   0.00  43.18  44.24
SO XBADJ    OCA1035-OCA8095    43.95  42.32  18.84  21.23  22.98   0.00
SO XBADJ    OCA1035-OCA8095    22.96  21.20  18.80   0.00   0.00   0.00
SO XBADJ    OCA1035-OCA8095     0.00   0.00   0.00   0.00 -60.29 -65.22
SO XBADJ    OCA1035-OCA8095   -68.16 -69.04 -47.25 -50.47 -52.15 -52.24
SO YBADJ    OCA1035-OCA8095    -6.67 -13.08 -19.10   0.00   0.00   0.00
SO YBADJ    OCA1035-OCA8095     0.00   0.00   0.00   0.00 -21.75 -12.44
SO YBADJ    OCA1035-OCA8095    -2.74   7.03 -19.03 -13.00  -6.58   0.00
SO YBADJ    OCA1035-OCA8095     6.67  13.08  19.10   0.00   0.00   0.00
SO YBADJ    OCA1035-OCA8095     0.00   0.00   0.00   0.00  21.75  12.44
SO YBADJ    OCA1035-OCA8095     2.74  -7.03  19.03  13.00   6.58  -0.04


SO BUILDHGT OCB1035-OCB8095    24.40  24.40  24.40  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT OCB1035-OCB8095     0.00   0.00  24.40  24.40  24.40   0.00
SO BUILDHGT OCB1035-OCB8095    24.40  39.62  39.62  39.62  24.40  24.40
SO BUILDHGT OCB1035-OCB8095    24.40   0.00   0.00  24.40  24.40  24.40
SO BUILDHGT OCB1035-OCB8095     0.00   0.00  24.40  24.40  24.40  24.40
SO BUILDWID OCB1035-OCB8095    12.71  17.11  20.98  24.22  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23   0.00   0.00   0.00   0.00   0.00
SO BUILDWID OCB1035-OCB8095     0.00   0.00  20.98  17.11  12.71   0.00
SO BUILDWID OCB1035-OCB8095    12.71  42.16  52.65  61.55  26.72  28.41
SO BUILDWID OCB1035-OCB8095    29.23   0.00   0.00  29.17  29.23  28.41
SO BUILDWID OCB1035-OCB8095     0.00   0.00  20.98  17.11  12.71   7.94
SO BUILDLEN OCB1035-OCB8095    29.17  29.23  28.41  26.72  24.22  20.98
SO BUILDLEN OCB1035-OCB8095    17.11   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN OCB1035-OCB8095     0.00   0.00  28.41  29.23  29.17   0.00
SO BUILDLEN OCB1035-OCB8095    29.17  76.22  73.51  68.57  24.22  20.98
SO BUILDLEN OCB1035-OCB8095    17.11   0.00   0.00  12.71  17.11  20.98
SO BUILDLEN OCB1035-OCB8095     0.00   0.00  28.41  29.23  29.17  28.22
SO XBADJ    OCB1035-OCB8095   -52.13 -50.43 -67.77 -68.98 -68.10 -65.14
SO XBADJ    OCB1035-OCB8095   -60.21   0.00   0.00   0.00   0.00   0.00
SO XBADJ    OCB1035-OCB8095     0.00   0.00  18.84  21.23  22.98   0.00
SO XBADJ    OCB1035-OCB8095    22.96 -262.12 -264.03 -257.92 43.88 44.16
SO XBADJ    OCB1035-OCB8095    43.10   0.00   0.00 -106.18 -110.52 -111.51
SO XBADJ    OCB1035-OCB8095     0.00   0.00 -47.25 -50.47 -52.15 -52.24
SO YBADJ    OCB1035-OCB8095    -6.67 -13.09  16.51   6.96  -2.80 -12.48
SO YBADJ    OCB1035-OCB8095   -21.78   0.00   0.00   0.00   0.00   0.00
SO YBADJ    OCB1035-OCB8095     0.00   0.00 -19.03 -13.00  -6.58   0.00
SO YBADJ    OCB1035-OCB8095     6.67  38.41  -1.07 -40.52   2.80  12.48
SO YBADJ    OCB1035-OCB8095    21.78   0.00   0.00  21.12   3.47 -14.29
SO YBADJ    OCB1035-OCB8095     0.00   0.00  19.03  13.00   6.58  -0.05


   SRCGROUP BASE35  OSA1035 OSB1035
   SRCGROUP BASE95  OSA1095 OSB1095
   SRCGROUP LD8020  OSA8020 OSB8020
   SRCGROUP LD8090  OSA8090 OSB8090
   SRCGROUP LD6020  OSA6020 OSB6020
   SRCGROUP LD6090  OSA6090 OSB6090

SO FINISHED
**
***************************************
** AERMOD Receptor Pathway
***************************************
**
**
RE STARTING
   INCLUDED BARTOW.ROU
RE FINISHED
**
***************************************
** AERMOD Meteorology Pathway
***************************************
**
**
ME STARTING
   SURFFILE c:\amodmet\TAMPA_2001.SFC
   PROFFILE c:\amodmet\TAMPA_2001.PFL
   SURFDATA 12842 2001 TAMPA_INT'L_ARPT
   UAIRDATA 12842 2001 RUSKIN_AP
   PROFBASE 19 FEET
ME FINISHED
**
***************************************
** AERMOD Output Pathway
```

```
*************************************
**
**
OU STARTING
  RECTABLE ALLAVE FIRST
OU FINISHED
```

AERBOB RELEASE 020304
AERMOD OUTPUT FILE NUMBER 1 :p1genfo.o01
AERMOD OUTPUT FILE NUMBER 2 :p1genfo.o02
AERMOD OUTPUT FILE NUMBER 3 :p1genfo.o03
AERMOD OUTPUT FILE NUMBER 4 :p1genfo.o04
AERMOD OUTPUT FILE NUMBER 5 :p1genfo.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, PHASE 1,10 G/S EM 7/22/06
Second title for last output file is: TAMPA/TAMPA 2001-2005, 2 SIMPLE-CYCLE CTS ONLY ON OIL

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: BASE35					
Annual					
	2001	0.05771	341650.	3082350.	01123124
	2002	0.05365	341650.	3082350.	02123124
	2003	0.03921	342550.	3081850.	03123124
	2004	0.05002	341650.	3082450.	04123124
	2005	0.05445	341750.	3082150.	05123124
HIGH 24-Hour					
	2001	0.88708	342450.	3081650.	01091424
	2002	0.98709	342550.	3081650.	02022724
	2003	0.66955	342550.	3081750.	03012324
	2004	1.81424	342250.	3081850.	04090524
	2005	1.31281	342050.	3081750.	05102424
HIGH 8-Hour					
	2001	1.74189	341550.	3082350.	01050816
	2002	1.87006	341550.	3083050.	02040816
	2003	1.76374	342550.	3081750.	03012316
	2004	3.95581	342250.	3081750.	04092608
	2005	3.53894	342050.	3081850.	05102408
HIGH 3-Hour					
	2001	3.69895	341950.	3081750.	01091409
	2002	2.41215	342550.	3081550.	02022706
	2003	2.32501	342550.	3081750.	03012315
	2004	5.09861	342350.	3081850.	04092606
	2005	5.43491	342050.	3081850.	05102406
HIGH 1-Hour					
	2001	6.42696	341950.	3081850.	01091407
	2002	6.17714	342450.	3081750.	02022706
	2003	4.47266	342250.	3081550.	03012320
	2004	8.20041	342250.	3081950.	04092607
	2005	8.41946	342050.	3081950.	05102407
SOURCE GROUP ID: BASE95					
Annual					
	2001	0.06220	341650.	3082350.	01123124
	2002	0.05779	341650.	3082350.	02123124
	2003	0.04225	342550.	3081850.	03123124
	2004	0.05386	341650.	3082450.	04123124
	2005	0.05879	341750.	3082150.	05123124
HIGH 24-Hour					
	2001	0.94867	342450.	3081650.	01091424
	2002	1.06241	342550.	3081650.	02022724
	2003	0.71446	342550.	3081750.	03012324
	2004	1.97146	342250.	3081850.	04090524
	2005	1.39281	342050.	3081750.	05102424
HIGH 8-Hour					
	2001	1.85313	341550.	3082350.	01050816
	2002	1.96935	341550.	3083050.	02040816
	2003	1.87720	342550.	3081750.	03012316
	2004	4.24650	342250.	3081850.	04092608
	2005	3.79688	342050.	3081850.	05102408
HIGH 3-Hour					
	2001	3.94540	342050.	3081950.	01091409
	2002	2.57602	342550.	3081550.	02022706
	2003	2.46306	342550.	3081750.	03012315
	2004	5.37162	342350.	3081850.	04092606
	2005	5.82146	342050.	3081850.	05102406
HIGH 1-Hour					
	2001	6.75568	341950.	3081850.	01091407
	2002	6.47288	342450.	3081750.	02022706
	2003	4.78180	342250.	3081650.	03012320
	2004	8.97112	342250.	3081950.	04092607
	2005	9.39688	342150.	3082050.	05102407
SOURCE GROUP ID: LD8020					
Annual					
	2001	0.05980	341650.	3082350.	01123124

2002	0.05553	341650.	3082350.	02123124
2003	0.04062	342550.	3081850.	03123124
2004	0.05180	341650.	3082450.	04123124
2005	0.05646	341750.	3082150.	05123124
HIGH 24-Hour				
2001	0.91617	342450.	3081650.	01091424
2002	1.02120	342550.	3081650.	02022724
2003	0.69235	342550.	3081750.	03012324
2004	1.90081	342250.	3081850.	04090524
2005	1.35007	342050.	3081750.	05102424
HIGH 8-Hour				
2001	1.79487	341550.	3082350.	01050816
2002	1.91658	341550.	3083050.	02040816
2003	1.82181	342550.	3081750.	03012316
2004	4.07801	342250.	3081850.	04092608
2005	3.65883	342050.	3081850.	05102408
HIGH 3-Hour				
2001	3.80290	342050.	3081950.	01091409
2002	2.48727	342550.	3081550.	02022706
2003	2.39655	342550.	3081750.	03012315
2004	5.21148	342350.	3081850.	04092606
2005	5.59774	342050.	3081850.	05102406
HIGH 1-Hour				
2001	6.56288	341950.	3081850.	01091407
2002	6.30558	342450.	3081750.	02022706
2003	4.59684	342250.	3081650.	03012320
2004	8.66756	342250.	3081950.	04092607
2005	9.00103	342150.	3082050.	05102407
SOURCE GROUP ID: LD8090				
Annual				
2001	0.06928	341650.	3082350.	01123124
2002	0.06430	341650.	3082350.	02123124
2003	0.04705	342550.	3081850.	03123124
2004	0.05992	341650.	3082450.	04123124
2005	0.06565	341750.	3082150.	05123124
HIGH 24-Hour				
2001	1.05988	342350.	3081750.	01091424
2002	1.18327	342550.	3081650.	02022724
2003	0.80422	341850.	3081250.	03112924
2004	2.21853	342250.	3081850.	04090524
2005	1.55095	342150.	3081850.	05102424
HIGH 8-Hour				
2001	2.03196	342250.	3081950.	01091416
2002	2.12351	341650.	3082950.	02040816
2003	2.04763	342550.	3081750.	03012316
2004	4.79685	342250.	3081850.	04092608
2005	4.17902	342050.	3081850.	05102408
HIGH 3-Hour				
2001	4.45265	342050.	3081950.	01091409
2002	2.82859	342550.	3081650.	02022706
2003	2.66102	342550.	3081750.	03012315
2004	6.10481	342250.	3081950.	04092606
2005	6.37562	342050.	3081850.	05102406
HIGH 1-Hour				
2001	7.20903	341950.	3081850.	01091407
2002	6.97832	342450.	3081750.	02022706
2003	5.25126	342250.	3081650.	03012320
2004	10.59479	342250.	3082050.	04092607
2005	10.90889	342150.	3082050.	05102407
SOURCE GROUP ID: LD6020				
Annual				
2001	0.06322	341650.	3082350.	01123124
2002	0.05868	341650.	3082350.	02123124
2003	0.04294	342550.	3081850.	03123124
2004	0.05473	341650.	3082450.	04123124
2005	0.05977	341750.	3082150.	05123124
HIGH 24-Hour				
2001	0.96536	342350.	3081750.	01091424
2002	1.07852	342550.	3081650.	02022724
2003	0.72658	342550.	3081750.	03012324
2004	2.02352	342250.	3081850.	04090524
2005	1.41665	342150.	3081850.	05102424
HIGH 8-Hour				
2001	1.87926	341550.	3082350.	01050816
2002	1.99141	341550.	3083050.	02040816
2003	1.90820	342550.	3081750.	03012316
2004	4.33403	342250.	3081850.	04092608
2005	3.84960	342050.	3081850.	05102408
HIGH 3-Hour				

2001	4.04340	342050.	3081950.	01091409
2002	2.60013	342550.	3081550.	02022706
2003	2.50118	342550.	3081750.	03012315
2004	5.48135	342350.	3081850.	04092606
2005	5.87902	342050.	3081850.	05102406

HIGH 1-Hour

2001	6.80407	341950.	3081850.	01091407
2002	6.52322	342450.	3081750.	02022706
2003	4.84265	342250.	3081650.	03012320
2004	9.32876	342250.	3082050.	04092607
2005	9.78327	342150.	3082050.	05102407

SOURCE GROUP ID: LD6090

Annual

2001	0.07185	341650.	3082350.	01123124
2002	0.06667	341650.	3082350.	02123124
2003	0.04880	342550.	3081850.	03123124
2004	0.06212	341650.	3082450.	04123124
2005	0.06814	341750.	3082150.	05123124

HIGH 24-Hour

2001	1.10072	342350.	3081750.	01091424
2002	1.22885	342550.	3081650.	02022724
2003	0.84082	341850.	3081250.	03112924
2004	2.31104	342250.	3081950.	04090524
2005	1.61657	342150.	3081850.	05102424

HIGH 8-Hour

2001	2.12980	342250.	3081950.	01091416
2002	2.18224	341650.	3082950.	02040816
2003	2.10928	342550.	3081750.	03012316
2004	4.98912	342250.	3081850.	04092608
2005	4.33860	342050.	3081850.	05102408

HIGH 3-Hour

2001	4.70814	342050.	3081950.	01091409
2002	2.95998	342450.	3081750.	02022706
2003	2.76020	342450.	3081950.	03012315
2004	6.44889	342250.	3081950.	04092606
2005	6.63610	342050.	3081850.	05102406

HIGH 1-Hour

2001	7.54574	342050.	3081950.	01091407
2002	7.24743	342450.	3081850.	02022706
2003	5.40929	342250.	3081650.	03012320
2004	11.15033	342250.	3082050.	04092607
2005	11.39807	342150.	3082050.	05102407

All receptor computations reported with respect to a user-specified origin

GRID 0.00 0.00

DISCRETE 0.00 0.00

```
CO STARTING
  TITLEONE 2001 BARTOW REPOWERING, AERMOD, PHASE 1,10 G/S EM 7/24/06
  TITLETWO TAMPA/TAMPA 2001-2005, 2 GAS HEATERS ONLY FOR PHASE 1
  MODELOPT DFAULT CONC
  AVERTIME PERIOD 24 8 3 1
  POLLUTID GEN
  RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** A, B, C, D ARE 4 ON 1 CC HRSG STACKS
** E IS THE SINGLE SIMPLE CYCLE UNIT
** Source ID format
**
** Example: G2A6035D
**
**    G= gas (O= oil)
**    C= COMBINED CYCLE, S= SIMPLE CYCLE
**    A, B, C, D ARE THE 4-ON-1 CC UNITS
**    E IS THE SINGLE SIMPLE CYCLE UNIT
**    60= load % (75= 75%, 10= 100%)
**    35= temperature deg F (59, 95)
**    D= duct burner (gas only, 100% load)


  LOCATION GASHEAT1 POINT 342217.500 3082540.000 0.0
  LOCATION GASHEAT2 POINT 342259.810 3082540.000 0.0

** Source Parameters **
  SRCPARAM GASHEAT1 5.0 18.3 533. 7.92 0.61
  SRCPARAM GASHEAT2 5.0 18.3 533. 7.92 0.61

** Building Downwash **

SO BUILDHGT GASHEAT1  24.40  24.40   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00  39.62  39.62  39.62   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT1   0.00   0.00   0.00  24.40  24.40   0.00
SO BUILDWID GASHEAT1  12.72  17.11   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00  52.65  61.55  68.57   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID GASHEAT1   0.00   0.00   0.00  17.11  12.71   0.00
SO BUILDLEN GASHEAT1  29.17  29.23   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00  73.51  68.57  61.55   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDLEN GASHEAT1   0.00   0.00   0.00  29.23  29.17   0.00
SO XBADJ    GASHEAT1 -101.31 -100.88   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00 -234.42 -235.97 -230.35   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO XBADJ    GASHEAT1   0.00   0.00   0.00 -101.33 -101.54   0.00
SO YBADJ    GASHEAT1   4.93 -10.20   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00  40.47   5.54 -29.57   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   0.00   0.00   0.00
SO YBADJ    GASHEAT1   0.00   0.00   0.00   8.98  -6.21   0.00

SO BUILDHGT GASHEAT2  24.40  24.40  24.40  24.40  24.40   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2   0.00  39.62  39.62  39.62   0.00   0.00
SO BUILDHGT GASHEAT2   0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT GASHEAT2  24.40  24.40   0.00   0.00   0.00   0.00
```

```
SO BUILDWID GASHEAT2  12.71  17.11  20.98  24.22  26.72  0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDWID GASHEAT2   0.00  42.16  52.65  61.55   0.00  0.00
SO BUILDWID GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDWID GASHEAT2  26.72  24.22   0.00   0.00   0.00  0.00
SO BUILDLEN GASHEAT2  29.17  29.23  28.41  26.72  24.22  0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDLEN GASHEAT2   0.00  76.22  73.51  68.57   0.00  0.00
SO BUILDLEN GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO BUILDLEN GASHEAT2  24.22  26.72   0.00   0.00   0.00  0.00
SO XBADJ   GASHEAT2 -101.52 -101.28 -118.54 -118.13 -114.13  0.00
SO XBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO XBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO XBADJ   GASHEAT2   0.00 -211.27 -213.26 -208.77  0.00  0.00
SO XBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO XBADJ   GASHEAT2 -122.76 -125.37  0.00   0.00   0.00  0.00
SO YBADJ   GASHEAT2   6.09  -9.10  11.61  -6.68 -24.77  0.00
SO YBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO YBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO YBADJ   GASHEAT2   0.00  34.42   3.83 -26.88   0.00  0.00
SO YBADJ   GASHEAT2   0.00   0.00   0.00   0.00   0.00  0.00
SO YBADJ   GASHEAT2  17.53  -1.95   0.00   0.00   0.00  0.00

   SRCGROUP ALL

SO FINISHED
**
*************************************
** AERMOD Receptor Pathway
*************************************
**
**
RE STARTING
   INCLUDED BARTOW.ROU
RE FINISHED
**
*************************************
** AERMOD Meteorology Pathway
*************************************
**
**
ME STARTING
   SURFFILE c:\amodmet\TAMPA_2001.SFC
   PROFFILE c:\amodmet\TAMPA_2001.PFL
   SURFDATA 12842 2001 TAMPA_INT'L_ARPT
   UAIRDATA 12842 2001 RUSKIN_AP
   PROFBASE 19 FEET
ME FINISHED
**
*************************************
** AERMOD Output Pathway
*************************************
**
**
OU STARTING
   RECTABLE ALLAVE FIRST
OU FINISHED
```

AERBOB RELEASE 020304
AERMOD OUTPUT FILE NUMBER 1 :p1gasht.o01
AERMOD OUTPUT FILE NUMBER 2 :p1gasht.o02
AERMOD OUTPUT FILE NUMBER 3 :p1gasht.o03
AERMOD OUTPUT FILE NUMBER 4 :p1gasht.o04
AERMOD OUTPUT FILE NUMBER 5 :p1gasht.o05
First title for last output file is: 2001 BARTOW REPOWERING, AERMOD, PHASE 1,10 G/S EM 7/24/06
Second title for last output file is: TAMPA/TAMPA 2001-2005, 2 GAS HEATERS ONLY FOR PHASE 1

AVERAGING TIME	YEAR	CONC (ug/m3)	X (m)	Y (m)	PERIOD ENDING (YYMMDDHH)
SOURCE GROUP ID: ALL					
Annual					
	2001	30.01574	342107.	3082404.	01123124
	2002	27.62168	342155.	3082404.	02123124
	2003	26.02689	342155.	3082404.	03123124
	2004	26.19474	342155.	3082404.	04123124
	2005	37.13205	342155.	3082404.	05123124
HIGH 24-Hour					
	2001	216.23444	342203.	3082404.	01110524
	2002	195.39903	342203.	3082404.	02110724
	2003	210.64326	342155.	3082404.	03111024
	2004	198.94339	342155.	3082404.	04010724
	2005	208.14363	342155.	3082404.	05011524
HIGH 8-Hour					
	2001	357.96759	341950.	3082150.	01100208
	2002	314.42160	342050.	3082350.	02122708
	2003	305.60886	342050.	3082350.	03120308
	2004	278.66522	342203.	3082404.	04011108
	2005	357.01132	342050.	3082350.	05101508
HIGH 3-Hour					
	2001	582.11383	341950.	3082150.	01100203
	2002	539.72003	341950.	3082150.	02110803
	2003	418.09583	341950.	3082150.	03111203
	2004	424.90527	341850.	3082050.	04010103
	2005	421.75366	341950.	3082150.	05010206
HIGH 1-Hour					
	2001	805.58398	341850.	3082150.	01110619
	2002	818.91931	341850.	3082150.	02102423
	2003	819.58026	341850.	3082150.	03102421
	2004	804.53333	341850.	3082150.	04112122
	2005	814.28271	341850.	3082150.	05102007

All receptor computations reported with respect to a user-specified origin
GRID 0.00 0.00
DISCRETE 0.00 0.00