BAYSIDE POWER STATION

SIMPLE-CYCLE COMBUSTION TURBINES UNITS 3 – 6

AIR CONSTRUCTION PERMIT APPLICATION (REVISED)

Prepared for:

TECO
TAMPA ELECTRIC
Tampa, Florida

Prepared by:

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Environmental Consulting & Technology, Inc.
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ECT No. 071286-0100

August 2008

TAMPA ELECTRIC

RECEIVED

AUG 11 2008

BUREAU OF AIR REGULATION

August 8, 2008

Ms. Trina Vielhauer
Florida Department of Environmental Protection
Division of Air Resource Management
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7984 9304 1500

Re: Tampa Electric Company - Bayside Power Station
Simple-Cycle Combustion Turbine Units 3 – 6
Project No. 0570040-024-024-AC, PSD-FL-399
Response to Request for Additional Information

Dear Ms. Vielhauer:

Tampa Electric Company (TEC) has received your letter of incompleteness dated April 18, 2008 requesting additional information with regard to the air construction permit application for the eight new simple cycle combustion turbines planned for the Bayside Power Station. A request for additional time to respond to the Request for Additional Information (RAI) was sent to the Department in correspondence dated July 17, 2008.

As discussed at the July 10, 2008 meeting between TEC and Florida Department of Environmental Protection (FDEP) staff in Tallahassee, further review of the TEC/ Environmental Protection Agency (EPA) Consent Decree shows that a portion of the actual emission reductions that occurred by the repowering of Gannon Unit 6 with Bayside Unit 2 are creditable with respect to the Prevention of Significant Deterioration (PSD) permitting program. Under the TEC/EPA Consent Decree, TEC had the choice of either: (a) continuing to combust coal in Gannon Unit 6 and install an SCR control system achieving a NO_x emission rate of 0.10 lb/mmBtu, or (b) repowering Gannon Unit 6 and meeting a NO_x emission limit of 3.5 ppm. TEC chose the latter option and repowered Gannon Unit 6 with Bayside Unit 2. Choosing to repower Gannon Unit 6 instead of continuing to combust coal and installing SCR controls resulted in significantly lower actual NO_x emissions. The difference in NO_x emissions (i.e., Gannon Unit 6 with SCR achieving 0.10 lb/mmBtu and repowering Unit 6 with Bayside Unit 2 achieving 3.5 ppmvd) represents the amount of creditable emission reduction available for the PSD netting analysis in accordance with Paragraph 86.1 of the EPA/TEC Consent Decree and results in a net NO_x emission decrease of approximately 490 tons per year. Accordingly, the proposed Bayside Pratt & Whitney Power Systems (PWPS) FT8-3® SwiftPac® simple-cycle combustion turbine Units 3 – 6 are not subject to PSD review. As advised by the Department, responses to questions in the Department's April 18, 2008 RAI related to NO_x controls are not required since the Bayside Peaker Project is not subject to PSD review for NO_x. TEC plans to submit a revised air

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construction permit application for the Bayside Peaker Project that will include a detailed netting analysis in accordance with Paragraph 86.1 of the TEC/EPA Consent Decree.

For your convenience, TEC has grouped related questions by topic and provided a response for each specific topic.

A. NO_x Best Available Control Technology (BACT)
As discussed above, responses to questions in the Department's April 18, 2008 RAI related to NO_x controls are not required since the Bayside Peaker Project is not subject to PSD review for NO_x. Accordingly, responses to Department questions FDEP-1 through FDEP-18, FDEP-24 through FDEP-26, FDEP-28 through FDEP-31, FDEP-33, and FDEP-34 are not provided.

B. Simple-Cycle Combustion Turbine Emissions and Monitoring
The Department's April 18, 2008 RAI included several questions related to estimated emissions and monitoring for the PWPS FT8-3® SwiftPac® units. The specific Department questions (FDEP-19, FDEP-20, FDEP-21, FDEP-22, FDEP-23, FDEP-27, and FDEP-35) and TEC's responses are as follows:

FDEP-19
For carbon monoxide (CO), provide a detailed plan for monitoring the CO catalyst reactivity and how CO emissions will be affected.

TEC Response to FDEP-19
Sacrificial CO catalyst coupons will be installed so that the catalyst can be periodically tested for reactivity. These are small coupons mounted separately in the exhaust gas stream that do not affect the performance and can be easily removed for testing.

FDEP-20
Besides performing annual compliance stack testing using EPA Method 10, 40 CFR 60, Appendix A, provide a detailed plan to periodically monitor CO emissions through some catalyst testing and/or parametric monitoring to demonstrate on-going compliance with the resultant CO standards. A CO continuous emissions monitoring system (CEMS) was not proposed.

TEC Response to FDEP-20
TEC plans to install a CO and diluent continuous emissions monitoring system (CEMS) on each SCCT to monitor CO emission rates. Details of the CO CEMS will be provided to the Department when available.

FDEP-21

Regarding the application pages, provide the calculations that were used to project the potential and allowable emissions for each pollutant. For any capacity and emissions dependent of the heating value of the fuel, be sure to use the same heating value (HHV or LHV) throughout for consistency purposes. The maximum heat input capacity value used in the application is 336 MMBtu/hr (HHV) from the use of natural gas

TEC Response to FDEP-21

Please see response to FDEP-22 below.

FDEP-22

For all of the tables in the write-up and in Appendix B, provide the calculations, assumptions, and any reference material that was used to establish these tables

TEC Response to FDEP-22

Example calculations are provided in Attachment 1 to this letter. The example calculations provided in Attachment 1 reflect the revised maximum annual operating hours of 3,500 hrs/yr/CT and heat input margin of 7.0 percent.

FDEP-23

Will there be an operational scenario where both combustion turbines in a pod (CT/pod) will be operating simultaneously? If yes, please explain.

TEC Response to FDEP-23

Each PWPS FT8-3® SwiftPac® consists of two SCCTs coupled to one common generator. As peaking units, a SwiftPac® will typically be operated with both SCCTs at 100 percent load. However, the SwiftPac® units include the capability to operate each SCCT independently. Accordingly, SwiftPac® operations may include one or both SCCTs at loads between 50 to 100 percent.

FDEP-27

Please estimate the CO_2 impacts from this project.

TEC Response to FDEP-27

Estimates of annual carbon dioxide (CO_2) emission rates for the Bayside Peaker Project are provided in Appendix B, Table B-1 of the revised air construction permit application for informational purposes. Note that CO_2 is not a pollutant subject to regulation under the Clean Air Act.

CO_2 is an asphyxiate at elevated concentrations. Maximum ambient CO_2 impacts due to Bayside Peaker Project emissions will be well below any levels of concern. For example, the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value - time-

weighted average (TLV-TWA) for 8-hour workday and 40-hour workweek exposure is 5,000 ppm. Exposure to this concentration may occur repeatedly day after day without adverse effect. Based on the criteria pollutant AERMOD dispersion modeling conducted for the Bayside Peaker Project, the maximum 8-hour average CO_2 impact is estimated to be approximately 65 ppm.

FDEP-35

Explain how you plan to demonstrate compliance with the NOx emissions standard using the emissions monitoring provisions of 40 CFR Part 75. Provide a detailed plan regarding this issue.

TEC Response to FDEP-35

A detailed Part 75 monitoring plan is not available at this stage of the Project. TEC will install NO_x emissions monitoring systems that comply with the requirements of 40 CFR Part 75. In accordance with 40 CFR §75.4(i)(2), monitoring system certification testing must be completed no later than 90 unit operating days or 180 calendar days (whichever occurs first) after the date the unit commences commercial operation. As required by 40 CFR §75.62, an initial monitoring plan will be submitted at least 21 days prior to the start of monitoring system certification testing. As noted on Page 1-2 of the revised air construction permit application, commencement of commercial operation is planned for May 15th 2009.

C. Black Start Emergency Generators

FDEP-32

For the proposed Black Start emergency generators (2), where are you going to store the fuel? Is there an existing storage tank on-site? If so, please describe.

TEC Response to FDEP-32

Fuel oil storage for the emergency generators will consist of either a small storage tank located near each engine or an integral tank located at the base of each engine.

D. U.S. EPA Region 4 Comments

As discussed above, responses to questions in the Department's April 18, 2008 RAI related to NO_x controls are not required since the Bayside Peaker Project is not subject to PSD review for NO_x. Accordingly, responses to U.S. EPA Region 4 questions EPA-1 and EPA-3 are not provided.

EPA-2

According to the PSD application, the annual emissions for this project were calculated using the operating scenario of 59°F and 100% load. Although this seems to be the worst case scenario for NOx emissions, according to Table B-4 in the appendix, CO and VOC emissions are actually higher at 20 and 50% load at 9.1 lb/hr and 5.1 lb/hr, respectively. The calculation of annual emissions should be done using the worst case scenario for each regulated NSR pollutant and PSD applicability should be evaluated based on the revised annual emissions calculations.

TEC Response to EPA-2

PSD applicability for new units is based on their potential to emit pursuant to Rule 62-212.400(2)(a)2., F.A.C. "Potential to Emit" is defined by Rule 62-210.200(244), F.A.C. as "the maximum capacity of an emissions unit or facility to emit a pollutant under its physical and operational design." The Bayside proposed simple cycle units will primarily be used to provide power to meet TEC's generation needs during periods of high demand and therefore will not normally operate at partial loads. The CO and VOC emission rates noted in EPA's question are at 20°F and 50% CT load operating conditions – neither condition will occur for every hour the simple cycle CTs are operated. For example, examination of the 2001-2005 Tampa meteorological data (total of 43,824 hours) used for the Bayside peaker project dispersion modeling shows annual minimum, average, and median temperatures of 27.9 °F, 72.5 °F, and 74.9 °F, respectively. Temperatures below 59.0 ° F occurred for only 5,972 hours (13.6 percent of the time) over the 2001-2005 time period. Temperatures below 40.0 °F only occurred for 252 hours (0.6 percent of the time) over the 5-year period. Accordingly, the CO and VOC emission rates at 59°F and 100% load represent a reasonable estimate of annual potential emissions.

E. Hillsborough County Environmental Protection Commission Comments

As discussed above, responses to questions in the Department's April 18, 2008 RAI related to NO_x controls are not necessary since the Bayside Peaker Project is not subject to PSD review for NO_x. Accordingly, responses to Hillsborough County Environmental Protection Commission questions EPC-3 and EPC-4 are not provided.

EPC-1

In accordance with Chapter 1-6.02.A.1.(a)(i), Rules of the Environmental Protection Commission of Hillsborough County, an application fee applies to permits that are to be reviewed pursuant to the authority of Chapter 84-446, Laws of Florida, and not pursuant to lull permit delegation from the Florida Department of Environmental Protection (FDEP). The fee for a prevention of significant deterioration construction project for a non-delegated facility is $480. Please submit the specified fee to the EPC.

TEC Response to EPC-1

Appendix C of the revised air construction permit application provides an assessment of PSD applicability in accordance with Paragraph 86.1 of the TEC/EPA Consent Decree. Since the BPS Peaker Project is no longer subject to PSD review, a fee is not required.

EPC-2

In the Air Construction Permit Application, under Section 3.3, TECO stated that the SCCT project qualifies as a major modification to an existing major facility and is subject to the PSD NSR requirements of Rule 62-212.400, F.A.C., for those pollutants that are emitted at or above the specified PSD significant emission rate levels. However, the application did not include the seven combined cycle natural gas fired turbines located at the Bayside Station. Pursuant to Rule 62-210.200(204) "Modification", F.A.C., a modification is defined as a physical change in, change in the method of operation of, or addition to a facility, which would result in an increase in actual emissions of any air pollutant regulated under the Act. On Page 5-7, Section 5.2 of the Application, it is stated that the SCCTs would reduce deliverable cost to double-peak loads where the SCCTs can dispatch to meet short duration heating demand more cost effectively than TECO's large operational constraint CCCTs (Combined Cycle Combustion Turbines). It appears from this statement that TECO is planning a change in the method of operation of the facility, which means that TECO needs to determine if there will be a net increase in actual emissions from the facility due to increase dependence on the SCCTs, as opposed to the existing CCCTs. Therefore, in accordance with Rule 62-212.400(2)(a)3., F.A.C., the Hybrid Test for Multiple Types of Emissions Units applies to this project, since it involves a combination of new and existing emissions units. EPC staff performed a PSD applicability analysis, and determined that the existing CCCTs and the proposed SCCTs emissions increase will exceed the significant emissions rates for VOC, NOx, CU, PM, PM1O, and SO2. Therefore, pursuant to Rule 62-212.400(10)(c), F.A.C., a BACT analysis is necessary for each PSD pollutant at each emissions unit, which would result in an significant net emissions increase as a result of the modification at the facility.

TEC Response to EPC-2

The proposed Bayside Power Station simple cycle combustion turbines and the previously permitted combined cycle combustion turbines are unrelated projects. There are no changes planned to the method of operation of the existing Bayside Power Station combined cycle combustion turbines which are primarily used to provide baseload generation. Appendix C of the revised air construction permit application provides an assessment of PSD applicability in accordance with Paragraph 86.1 of the TEC/EPA Consent Decree.

In addition, TEC notes that there has been a substantial reduction in actual emissions due to the re-powering of the F.J. Gannon Station. For example, based on data obtained from the EPA Clean Air Markets website, F.J. Gannon Station actual SO_2 and NO_x emissions in 1996 were 62,993.6 and 36,449.0 tons, respectively. In 2006, the Bayside Power Station had actual SO_2 and NO_x emissions of 15.6 and 359.8 tons, respectively, resulting in a reduction in actual SO_2 emissions of 62,978.0 tons per year, and a reduction in actual NO_x emissions of 36,089.2 tons per year. The Bayside Peaker Project potential NO_x emission rate of 449.6 tons per year is only 1.2 percent of the amount of actual NO_x emission reduction that has occurred due to the re-powering of the F.J. Gannon Station.

TEC understands that with the submission of this additional information and the revised air construction permit application, the Department will continue processing our request for an air construction permit for Bayside Power Station simple cycle Units 3 through 6. If you have any further questions regarding this matter, please contact me at (813) 228-1095.

Sincerely,

David Lukcic
Manager Environmental Projects
Environmental Health and Safety

EHS/rlk/DML154

Enclosure

c/enc: Mr. Jeff Koerner, FDEP
Mr. David Lloyd, EPA Region 4
Ms. Mara Grace Nasca, FDEP SW
Mr. Sterlin Woodard, EPCHC

ATTACHMENT 1

RESPONSE TO FDEP-21 AND FDEP-22
EMISSION RATE CALCULATIONS

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

Emissions data for the Pratt & Whitney (P&W) FT8-3 Swift Pac combustion turbines (CTs) are provided in Appendix B of the permit application, Tables 1 through 11 as revised. The original Appendix B emission rate calculations were revised to reflect: (a) maximum annual operating hours of 3,500 hrs/yr/CT, and (b) heat input margin of 7 percent. The following sections provide the basis for each emission rate calculation.

Note that the calculation results provided in Tables 1 through 13 used the full electronic spreadsheet precision; i.e., were not rounded. For this reason, a check of the calculations using the data shown in Tables 1 through 11 may, in some cases, produce slightly different results because the tables do not display all of the 15 digits used by the electronic spreadsheet.

Table 1: CT Annual Emission Rate Summary

The criteria pollutant emissions on this table are taken directly from Table 7 for the CTs and Table 10 for the emergency engines. The annual emissions from Table 10 were multiplied by two to account for both engines. The HAPs are shown for the CTs only, and are from Table 6. The H_2SO_4 mist is also from Table 7. The CO_2 emissions were based on emission factors, heat input rates, and operating hours, and were calculated as shown below.

CO_2 Calculation for the CTs:

AP-42 CO_2 Emission Factor = 110 lb/MMBtu (from AP-42 Table 3.1-2a)

Heat Input per CT = 342.7 MMBtu/hr (from Table 9)

Annual Operating Hours = 3,500 hours per year (from Table 2)

CO_2 = 110 lb/MMBtu x 342.7 MMBtu/hr x 3,500 hr/yr x ton/2,000 lb x 8 CTs = 527,799 ton/yr

CO_2 Calculation for the Emergency Engines:

AP-42 CO_2 Emission Factor = 165 lb/MMBtu (from AP-42 Table 3.4-1)

Heat Input per Engine = 7.89 MMBtu/hr (from Table 11)

Annual Operating Hours = 100 hours per year (from Table 10)

CO_2 = 165 lb/MMBtu x 7.89 MMBtu/hr x 100 hr/yr x ton/2,000 lb x 2 engines = 130 ton/yr

Table 2: CT Operating Scenarios

Operating scenarios identified in Table 2 represent the range of loads (50 to 100 percent), approximate ambient temperatures (20 to 90°F), fuel types (natural gas), and use of evaporative cooling under which Units 3-6 will operate.

Table 3: Hourly PM/PM$_{10}$, SO$_2$, H$_2$SO$_4$ Mist, and Pb Emission Rates (per CT) - Natural Gas

A. PM/PM$_{10}$

For each ambient temperature and CT operating load, PM/PM$_{10}$ emissions in lb/hr were based on P&W data for PM/PM$_{10}$ as measured by EPA Reference Method 5B or 17. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 2; 20°F ambient temperature, 75% load

P&W PM/PM_{10} = 2.5 lb/hr

PM/PM_{10} = 2.5 lb/hr x 0.126 = 0.32 g/s

B. SO_2

For each ambient temperature and CT operating load, SO_2 emissions in lb/hr were based on P&W fuel flow data, natural gas sulfur content of 2.0 gr S/100 ft^3, natural gas density of 0.0451 lb/ft^3, and conversion factor of 7,000 grains per pound. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 4; 59°F ambient temperature, 100% load

Fuel Flow = 13,967 lb/hr NG

Margin = 7%

Adjusted Fuel Flow = Fuel Flow x Margin = 13,967 lb/hr x 1.07 =14,945 lb/hr

SO_2 = (14,945 lb/hr NG) x (2.0 gr S / 100 ft^3) x (ft^3 / 0.0451 lb NG)

x (1 lb S / 7,000 gr S) x (2 lb SO_2 / 1 lb S)

SO_2 = 1.89 lb/hr

SO_2 = 1.89 lb/hr x 0.126 = 0.24 g/s

C. H_2SO_4

For each ambient temperature and CT operating load, H_2SO_4 emissions in lb/hr were based on an assumed 7.5% conversion rate by volume of SO_2 to H_2SO_4. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 7; 90°F ambient temperature, 100% load

SO_2 = 1.79 lb/hr

H_2SO_4 = (1.79 lb/hr SO_2) x (7.5 / 100) x (98 lb-mole H_2SO_4 / 64 lb-mole SO_2)

H_2SO_4 = 0.21 lb/hr

H_2SO_4 = 0.21 lb/hr x 0.126 = 0.026 g/s

D. Lead

For each ambient temperature and CT operating load, estimates of lead emission rates were developed using an emission factor from the EPA AP-42 (Section 1.4 Natural Gas Combustion, Table 1.4-2), and P&W heat input rates.

Example: Case 1; 20°F ambient temperature, 100% load

P&W Fuel Flow = 14,763 lb/hr (with margin)

Heat Input = 14,763 lb/hr x 22,933 Btu/lb [HHV] = 338.6 x 10^6 Btu/hr [HHV]

Lead Emission Factor = 4.9 x 10^{-7} lb / 10^6 Btu

Lead = (338.6 x 10^6 Btu/hr) x (4.9 x 10^{-7} lb / 10^6 Btu)

Lead = 0.00017 lb/hr (Negligible)

Table 4: NO_x, CO, and CO Emission Rates (per CT) - Natural Gas

E. NO_x

For each ambient temperature and CT operating load, NO_x emissions in ppmvd at 15% O_2 and lb/hr were based on P&W data. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 3; 20°F ambient temperature, 50% load

P&W NO_x = 25 ppmvd @ 15% O_2 P&W NO_x = 18.2 lb/hr

NO_x = 18.2 lb/hr

NO_x = 18.2 lb/hr x 0.126 = 2.29 g/s

F. CO

For each ambient temperature and CT operating load, CO emissions in ppmvd at 15% O_2 and lb/hr were based on P&W data. The efficiency of the oxidation catalyst was used to determine the final emissions in the exhaust. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 7; 90°F ambient temperature, 100% load

P&W CO = 6.0 ppmvd @ 15% O_2 P&W CO = 44.1 lb/hr

Oxidation Catalyst Efficiency = 90%

CO = 44.1 lb/hr x (100-90)/100 = 4.4 lb/hr

CO = 4.4 lb/hr x 0.126 = 0.56 g/s

G. VOC

For each ambient temperature and CT operating load, VOC emissions in ppmvd at 15% O_2 and lb/hr were based on P&W data. Emissions in lb/hr were converted to g/s by multiplying by a conversion factor of 0.126.

Example: Case 5; 59°F ambient temperature, 75% load

P&W VOC = 5.5 ppmvd @ 15% O_2 P&W VOC = 3.8 lb/hr

Oxidation Catalyst Efficiency = 50%

VOC = 3.8 lb/hr x (100-50)/100 = 1.9 lb/hr

VOC = 1.9 lb/hr x 0.126 = 0.24 g/s

Table 5: Hazardous Air Pollutant Hourly Emission Rates - Natural Gas (Per CT)

Estimates of hazardous air pollutant emission rates were developed using emission factors from the references shown at the bottom of Table 5 and P&W heat input data for all operating cases. As indicated in the second footnote of the table, the emission factors for the organic compounds have been adjusted to account for the control efficiency of the oxidation catalyst. The maximum hourly heat input rate occurs at 59°F ambient temperature, 100% load i.e., Case 4. The maximum hourly and annual emission estimates were based on Case 4. For annual emission estimates, continuous operation (2,500 hrs/yr) was assumed.

Example: Maximum Hourly Naphthalene; Case 1; 20°F ambient temperature, 100% load

P&W CT Heat Input = 338.6 x 10^6 Btu/hr [HHV] (with margin)

Naphthalene AP-42 Emission Factor = 1.30 x 10^{-6} lb / 10^6 Btu

Since naphthalene is an organic, the emission factor is adjusted to account for 50% control efficiency.

Adjusted Emission Factor = 1.30 x 10^{-6} lb / 10^6 Btu x 0.5 = 6.50 x 10^{-6} lb / 10^6 Btu

Naphthalene = (338.6 x 10^6 Btu/hr) x (6.50 x 10^{-7} lb / 10^6 Btu)

Naphthalene = 2.20 x 10^{-4} lb/hr

Table 6: Hazardous Air Pollutant Annual Emission Rates (8 CTs)

Annual hazardous air pollutant emission rates were determined based on the maximum pollutant hourly rates contained in Table 5 (i.e., Case 4, 59°F, 100% CT load, natural gas firing), and assuming that all eight CTs operate for 2,500 hours per year.

Example: Maximum Annual Naphthalene; Case 4; 59°F ambient temperature, 100% load

Naphthalene = (2.23 x 10^{-4} lb/hr) x (3500 hr/yr) x (ton / 2,000 lb) x 8 CTs

Naphthalene = 3.12 x 10^{-3} ton/yr

Table 7: Annual Criteria and Sulfuric Acid Mist Pollutant Emission Rates

Annual emission rates were determined from the pollutant hourly rates for Case 4 (59°F, 100% CT load, natural gas firing), and assuming that each CT operates for 3,500 hours per year. An example calculation for NO_x follows:

Example: NO_x

Case 4 NO_x Hourly Emission Rate = 32.0 lb/hr (per CT)

Annual NO_x = 32.0 lb/hr x 3,500 hrs/yr x ton/ 2000 lb x 8 CTs

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

Annual NO_x = 448.0 ton/yr

Table 8: CT Exhaust Data, Natural Gas (Per CT)

Table 8.A.: Exhaust Molecular Weight (MW)

Exhaust gas compositions (volume %), exhaust flow rates (lb/sec), and exhaust temperatures (°F) shown in Table 8.A were obtained from the P&W performance specification data.

1. Exhaust gas molecular weight was calculated by multiplying the exhaust composition (in volume % divided by 100) by the component molecular weight (in lb/lb-mole) and summing all components.

Example: Case 7 (90°F, 100% Load)

$$MW = [(0.842/100) \times 39.944] + [(70.8/100) \times 28.013] + [(12.6/100) \times 31.999] + [(3.27/100) \times 44.010] + [(12.45/100) \times 18.015]$$

$$MW = 27.88 \text{ lb/lb-mole}$$

2. Exhaust temperatures (in units of °K) were calculated by converting the P&W exhaust temperatures (in units of °F)

Example: Case 8 (90°F, 75% Load)

P&W Exhaust Temperature: 864 °F

Exhaust Temperature = (864 °F + 459.67) / (1.8)

Exhaust Temperature = 735 °K

3. Exhaust oxygen concentrations, dry were calculated by correcting the P&W exhaust oxygen concentrations, wet, to dry conditions.

Example: Case 6 (59°F, 50% Load)

P&W Exhaust Oxygen Concentration: 14.9 volume % (wet)

P&W Exhaust Water Concentration: 8.05 volume %

Exhaust Oxygen Concentration (dry) = [(14.9) / (100 – 8.05)] x 100

Exhaust Oxygen Concentration = 16.20 volume % (dry)

Table 8.B.: Exhaust Flow Rates Data

Exhaust gas flow rates (actual, standard, and actual at 15% O_2, dry) were calculated based on the P&W data shown in Table 8A. Stack diameter was provided by TEC. Stack exit velocity was calculated based on the exhaust flow rates and calculated stack area.

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EXPLANATION OF APPENDIX B EMISSIONS DATA

1. Exhaust gas flow rates, in units of actual cubic feet per minute, were calculated based on the P&W exhaust flow rates (in units of lb/sec) and molecular weights shown in Table 8A and the Ideal Gas Law.

Example: Case 1 (20°F, 100% Load)

P&W Exhaust Flow Rate: 212.0 lb/sec (from Table 8A)

Exhaust Gas Molecular Weight: 28.22 lb/lb-mole (from Table 8A)

P&W Exhaust Gas Temperature: 828 °F (from Table 8A)

Volume of one lb-mole at 68°F: 385.3 ft^3/lb-mole (Ideal Gas Law)

Exhaust Gas Flow Rate (acfm) = (212.0 lb/sec) x (60 sec/min) x (lb-mole / 28.22 lb)
x (385.3 ft^3/lb-mole) x [(828 + 460) / (68 + 460)]

Exhaust Gas Flow Rate = 423,625 acfm

2. Stack area was calculated based on the stack exit diameter provided by TEC.

Example: All Cases

Stack Exit Diameter: 9.5 ft; 2.896 m

Stack Exit Area = π x $(9.5 \text{ ft} / 2)^2$

Stack Exit Area = 70.88 ft^2; 6.59 m^2

3. Stack exit velocities were calculated by dividing the calculated actual exhaust flow rate by the stack exit area.

Example: Case 3 (20°F, 50% Load)

Calculated Actual Exhaust Flow Rate: 287,770 ft^3/min (From Table 8B)

Calculated Stack Exit Area: 70.88 ft^2

Stack Exit Velocity = (287,770 ft^3/min) x (1 min / 60 sec) x (1 / 70.88 ft^2)

Stack Exit Velocity = 67.7 ft/sec; 20.6 m/sec

4. Exhaust gas flow rates, in units of dry, standard (at 68 °F) actual cubic feet per minute, were calculated based on the P&W exhaust flow rates (in units of lb/sec), moisture contents, and molecular weights shown in Table 8A and the Ideal Gas Law.

Example: Case 7 (90°F, 100% Load)

P&W Exhaust Flow Rate: 192.0 lb/sec (from Table 8A)

P&W Exhaust Gas Moisture Content: 12.45 volume % (from Table 8A)

Exhaust Gas Molecular Weight: 27.88 lb/lb-mole (From Table 8A)

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

Volume of One lb-mole at 68°F: 385.3 ft^3/lb-mole (Ideal Gas Law)

Exhaust Gas Flow Rate (dscfm) = (192.0 lb/sec) x (60 sec / min) x (lb-mole / 27.88 lb) x (385.3 ft^3/lb-mole) x [1 - (12.45 / 100)]

Exhaust Gas Flow Rate = 139,366 dscfm

5 Exhaust gas flow rates, in units of dry, standard cubic feet per minute corrected to 15% O_2, were calculated by correcting the standard dry exhaust flow rate (dscfm) to 15% O_2.

Example: Case 9 (90°F, 50% Load)

Exhaust Flow Rate: 105,847 dscfm (from Table 8B)

Calculated Exhaust Oxygen Content: 16.0 volume % (dry) (from Table 8A)

Atmospheric Oxygen Content: 20.9 volume %

Exhaust Gas Flow Rate (dscfm @ 15% O_2) = (105,847 dscfm) x [(20.9 – 16.0) / (20.9 – 15.0)]

Exhaust Gas Flow Rate = 87,907 dscfm @ 15% O_2

Table 9: Fuel Flow Rate Data (Per CT) - Natural Gas

Data shown in Table 9 is based on P&W fuel flow rates, and the heat contents and densities of natural gas. The P&W fuel rate (lb/hr) as shown on the table has been adjusted to include a 7 % margin. The heat input values and conversions to other fuel rate units have been derived from the adjusted P&W fuel rate.

Example: Natural Gas Case 5 (59°F, 75% load)

P&W fuel rate = 10,827 lb/hr

Adjusted fuel rate = 10,827 lb/hr x 1.07 = 11,585 lb/hr

Natural Gas Density = 0.0451 lb/ft^3

Natural Gas Heat Content: 22,933 Btu/lb (HHV)

Natural Gas Heat Content: 20,671 Btu/lb (LHV)

Heat Input (LHV) = 11,585 lb/hr x 20,671 Btu/lb x ($10^6/10^6$) = 239.5 MMBtu/hr

Heat Input (HHV) = 11,585 lb/hr x 22,933 Btu/lb x ($10^6/10^6$) = 265.7 MMBtu/hr

Fuel Rate = 11,585 lb/hr / 0.0451 lb/ft^3 x ($10^6/10^6$) = 0.257 10^6 ft^3/hr

Fuel Rate = 11,585 lb/hr x hr/3,600 sec = 3.218 lb/sec

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

Table 10: Emergency Diesel Engines, Criteria Pollutant Emission Rates

The emission rates in units of g/hp-hr for NO_x, CO, VOC, and PM were provided by the vendor. The horsepower was derived from the electrical output rating (kWe) of the engine. The emission rates for SO_2 were derived from the fuel flow, density, and fuel sulfur content information, which were also provided.

Example: Derivation of Horsepower

Electrical Output Rating = 800 kWe
Assumed Efficiency = 80%

Horsepower = 800 kWe x (1/(80/100)) x hp/0.7457 kW = 1,340 hp

Example: Criteria Pollutant Calculation for NO_x

NO_x Emission Rate = 5.26 g/hp-hr
Operating Hours = 100 hr/yr

NO_x (lb/hr) = 5.26 g/hp-hr x 0.002204 lb/g x 1,340 hp =15.5 lb/hr

NO_x (ton/yr) = 15.5 lb/hr x 100 hr/yr x ton/2,000 lb = 0.78 ton/yr

Example: Calculation of SO_2 Emissions

Maximum Fuel Flow = 57.2 gal/hr

Fuel Sulfur Content = 0.0015 wt % S (for ultra low sulfur diesel)

Fuel Density = 7.08 lb/gal

SO_2 (lb/hr) = 57.2 gal/hr x 7.08 lb/gal x 0.0015 % S/100% x 2 lb SO_2/1lb S = 0.012 lb/hr

SO_2 (ton/yr) = 0.012 lb/hr x 100 hr/yr x ton/2,000 lb = 0.0006 ton/yr

SO_2 (g/hp-hr) = 0.012 lb/hr x g/0.0022046 lb x 1/ 1,340 hp = 0.004 g/hp-hr

Table 11: Emergency Diesel Engines, Hazardous Air Pollutant Emission Rates

The HAPs were based on EPA AP-42 emission factors (Section 3 Table 3.3-2), and the information supplied by the vendor.

Example: Calculation of Formaldehyde Emissions

Maximum Fuel Flow = 57.2 gal/hr

Fuel Heat Content = 138,000 Btu/gal (HHV)

AP-42 Formaldehyde Emission Factor = 0.00118 lb/MMBtu

Operating Hours = 100 hr/yr

Engine Heat Input = 57.2 gal/hr x 138,000 Btu/gal x ($10^6/10^6$) = 7.89 MMBtu/hr

Formaldehyde (lb/hr) = 0.00118 lb/MMBtu x 7.89 MMBtu/hr = 0.00931 lb/hr

Formaldehyde (ton/yr) = 0.00931 lb/hr x 100 hr/yr x ton/2,000 lb = 0.000466 ton/yr

Table 12: CT Stack Parameters – Natural Gas

The data in this table is also contained in Table 8. The exhaust velocities and temperatures are shown to more decimal places, but their derivation was previously described.

Table 13: Emergency Diesel Engines, Stack Parameters

The stack height, diameter, flow rate, and exhaust temperature were provided by the vendor. Examples of the conversions, e.g., feet to meters, and the derivation of stack area and exit velocity have previously been given for Table 8.

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

LIST OF ACRONYMS

°F	degrees Fahrenheit
°K	degrees Kelvin
%	percent
acfm	actual cubic feet per minute
AP-42	EPA's Compilation of Air Pollutant Emission Factors, 5th Edition
Btu	British thermal unit
Btu/hr	British thermal units per hour
CO	carbon monoxide
CO_2	carbon dioxide
CT	combustion turbine
dscfm	dry standard cubic feet per minute
EPA	United States Environmental Protection Agency
ft	feet
ft^2	square feet
ft^3	cubic feet
ft/sec	feet per second
ft^3/min	cubic feet per minute
ft^3/lb-mole	cubic feet per pound mole
gal/hr	gallons per hour
g	gram
g/hp-hr	grams per horsepower hour
g/s	grams per second
gr	grain
gr S	grains of sulfur
gr S/100 ft^3	grains of sulfur per 100 cubic feet
H_2SO_4	sulfuric acid, or sulfuric acid mist
HAP	hazardous air pollutant
HHV	higher heating value
hp	horsepower
hr	hour
hr/yr	hours per year
kW	kilowatt
kWe	kilowatts electric
lb	pounds
lb/ft^3	pounds per cubic feet
lb/gal	pounds per gallon
lb/hr	pounds per hour
lb/sec	pounds per second
LHV	lower heating value
lb/MMBtu	pounds per million British thermal units
MMBtu/hr	million British thermal units per hour
lb-mole	pound mole
lb/lb-mole	pound per pound mole
lb/sec	pound per second
m	meter
m^2	square meters
m/sec	meters per second
min	minute
NG	natural gas
NO_x	nitrogen oxides

TEC BAYSIDE POWER STATION
EXPLANATION OF APPENDIX B EMISSIONS DATA

O_2	oxygen
P&W	Pratt & Whitney
Pb	lead
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
ppmvd	parts per million by volume, dry
S	sulfur
sec	second
sec/min	seconds per minute
SO_2	sulfur dioxide
TEC	Tampa Electric Company
ton/yr	ton per year
ULSD	ultra low sulfur distillate
VOC	volatile organic compound
wt % S	weight percent sulfur
yr	year

BAYSIDE POWER STATION

SIMPLE-CYCLE COMBUSTION TURBINES UNITS 3 – 6

AIR CONSTRUCTION PERMIT APPLICATION (REVISED)

Prepared for:

TAMPA ELECTRIC
Tampa, Florida

Prepared by:

ECT
Environmental Consulting & Technology, Inc.
3701 Northwest 98th Street
Gainesville, Florida 32606

ECT No. 071286-0100

August 2008

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1.0 INTRODUCTION

Tampa Electric Company (TEC) previously submitted an air construction permit application in March 2008 to construct and operate eight simple-cycle combustion turbines (SCCTs) at its existing H.L. Culbreath Bayside Power Station (BPS). The BPS is located on Port Sutton Road in Tampa, Hillsborough County, Florida. The March 2008 air construction permit application has been revised to: (a) include a Prevention of Significant Deterioration (PSD) netting analysis pursuant to the procedures specified in the TEC/U.S. Environmental Protection Agency (EPA) Consent Decree, (b) increase the annual operating hours for the proposed SCCTs from 2,500 to 3,500 hours per year (hr/yr) per combustion turbine (CT), and (c) increase the SCCT heat input margin from 5 to 7 percent based on recent information received from the SCCT vendor, Pratt & Whitney Power Systems (PWPS).

The BPS SCCT project will consist of four nominal 62-megawatt (MW), simple-cycle aeroderivative PWPS FT8-3® SWIFTPAC® units. Each PWPS FT8-3® SWIFTPAC® unit is comprised of two SCCTs coupled to one common generator having a nominal gross generation capacity of 62 MW. Accordingly, there will be a total of eight SCCTs and four generators. The SCCTs will be fired exclusively with pipeline-quality natural gas containing no more than 2.0 grains of total sulfur per one hundred standard cubic feet (gr S/100 scf) and will operate in peaking service for no more than 3,500 hr/yr per SCCT. The SCCTs will utilize water injection and oxidation catalyst technologies to control emissions of nitrogen oxides (NO_x) and carbon monoxide (CO), respectively.

The SCCT peaker project will also include two black start emergency diesel engine/generator sets. Excluding emergency conditions, the diesel engine/generator sets will only be operated for approximately two hours per week (100 hr/yr) each for routine testing and maintenance purposes. The emergency diesel engines will be fired with ultra low sulfur diesel (ULSD) fuel oil.

Based on an evaluation of anticipated worst-case annual operating scenarios, the BPS SCCT project will have the potential to emit 449.6 tpy of NO_x, 65.4 tpy of CO, 35.0 tpy of particulate matter (PM)/particulate matter less than or equal to 10 micrometers aerodynamic diameter (PM_{10}), 26.5 tpy of sulfur dioxide (SO_2), and 18.9 tpy of volatile organic compounds (VOCs). Regarding noncriteria pollutants, the BPS SCCT project will potentially emit 3.0 tpy of sulfuric acid (H_2SO_4) mist and trace amounts of organic compounds associated with natural gas combustion.

The planned construction start date for the SCCT project is September 30, 2008. The projected date for the facility to begin commercial operation is May 15, 2009, following initial equipment start-up and completion of required performance testing.

As discussed at the July 10, 2008, meeting between TEC and the Florida Department of Environmental Protection (FDEP) staff in Tallahassee, further review of the TEC/EPA Consent Decree shows that a portion of the actual emission reductions that occurred by the repowering of Gannon Unit 6 with Bayside Unit 2 are creditable with respect to the PSD permitting program. Under the TEC/EPA Consent Decree, TEC had the choice of either: (a) continuing to combust coal in Gannon Unit 6 and install a selective catalytic reduction (SCR) control system achieving a NO_x emission rate of 0.10 pounds per million British thermal units (lb/MMBtu), or (b) repowering Gannon Unit 6 and meeting a NO_x emission limit of 3.5 parts per million (ppm). TEC chose the latter option and repowered Gannon Unit 6 with Bayside Unit 2. Choosing to repower Gannon Unit 6 instead of continuing to combust coal and installing SCR controls resulted in significantly lower actual NO_x emissions. The difference in NO_x emissions (i.e., Gannon Unit 6 with SCR achieving 0.10 lb/MMBtu and repowering Unit 6 with Bayside Unit 2 achieving 3.5 ppm) represents the amount of creditable emission reduction available for the PSD netting analysis in accordance with Paragraph 86.1 of the TEC/EPA Consent Decree and results in a net NO_x emission decrease of approximately 490 tons per year (tpy). Accordingly, the proposed Bayside PWPS FT8-3® SWIFTPAC® simple-cycle combustion turbine Units 3 – 6 are not subject to PSD review.

The BPS SCCT project is also not subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Combustion Turbines (40 Code of Federal Regulations [CFR] 63, Subpart YYYY) since the existing BPS is a minor source of hazardous air pollutants (HAPs), and the addition of the eight P&W SCCTs will not change that classification. In addition, the effectiveness of Subpart YYYY was stayed by EPA on August 18, 2004, for diffusion flame gas-fired turbines—the type of turbine proposed for the BPS SCCT project. The BPS SCCTs will be subject to the applicable requirements of New Source Performance Standard (NSPS) Subpart KKKK, Standards of Performance for Stationary Combustion Turbines.

Operation of the proposed BPS SCCTs will result in airborne emissions. Therefore, a permit is required prior to the beginning of facility construction, per Rule 62-212.300(1)(a), Florida Administrative Code (F.A.C.). This report, including the required permit application forms and supporting documentation included in the appendices, constitutes TEC's application for authorization to commence construction in accordance with FDEP permitting rules contained in Chapter 62-212, et. seq., F.A.C.

Following this introduction, the revised air construction permit application package is organized as follows:

- Section 2.0 describes the proposed facility and associated air emissions.
- Section 3.0 describes national and state air quality standards and discusses applicability of new source review (NSR) procedures to the proposed project.
- Section 4.0 describes the applicable state and federal emission standards.
- Section 5.0 lists the references used in preparing the report.

Appendices A and B provide FDEP's Application for Air Permit—Long Form and emission rate calculations, respectively. An analysis of PSD applicability based on the procedures specified in the TEC/EPA Consent Decree is provided in Appendix C.

2.0 DESCRIPTION OF THE PROPOSED FACILITY

2.1 PROJECT DESCRIPTION, AREA MAP, AND PLOT PLAN

The proposed new PWPS SCCTs will be located at the existing BPS. The BPS is located on Port Sutton Road in Tampa, Hillsborough County, Florida. Figure 2-1 provides portions of a U.S. Geological Survey (USGS) topographical map showing the BPS site location and nearby prominent geographical features.

The proposed SCCT project consists of four PWPS FT8-3® SWIFTPAC® aeroderivative CT units. Each PWPS FT8-3® SWIFTPAC® unit consists of two SCCTs coupled to one common generator having a nominal gross generation capacity of 62 MW. Total BPS SCCT project nominal gross generation capacity is 248 MW. The PWPS FT8-3® SWIFTPAC® SCCTs will be fired exclusively with pipeline-quality natural gas. The new SCCTs will operate in peaking service for no more than 3,500 hr/yr per SCCT and will normally operate between 50- and 100-percent load. The SCCT peaker project will also include two black start emergency diesel engine/generator sets. Excluding emergency conditions, the diesel engine/generator sets will only be operated for approximately 2 hours per week (100 hr/yr) each for routine testing and maintenance purposes. The emergency diesel engines will be fired with ULSD fuel oil.

Combustion of natural gas in the SCCTs and ULSD fuel oil in the emergency diesel engines will result in emissions of PM/PM_{10}, SO_2, NO_x, CO, VOCs, H_2SO_4 mist, and minor amounts of HAPs. Emissions control systems proposed for the SCCTs include the use of water injection for control of NO_x; oxidation catalyst for abatement of CO and VOCs; and use of clean, low-sulfur, low-ash natural gas to minimize PM/PM_{10}, SO_2, and H_2SO_4 mist emissions. Emissions from the emergency diesel engines will comply with the requirements of NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

Figure 2-2 provides a site plan showing the BPS existing combined-cycle units and major facility structures and the proposed new SCCTs and emergency diesel engines. Additional details of the SCCTs are provided on Figure 2-3. Primary access to the BPS is from

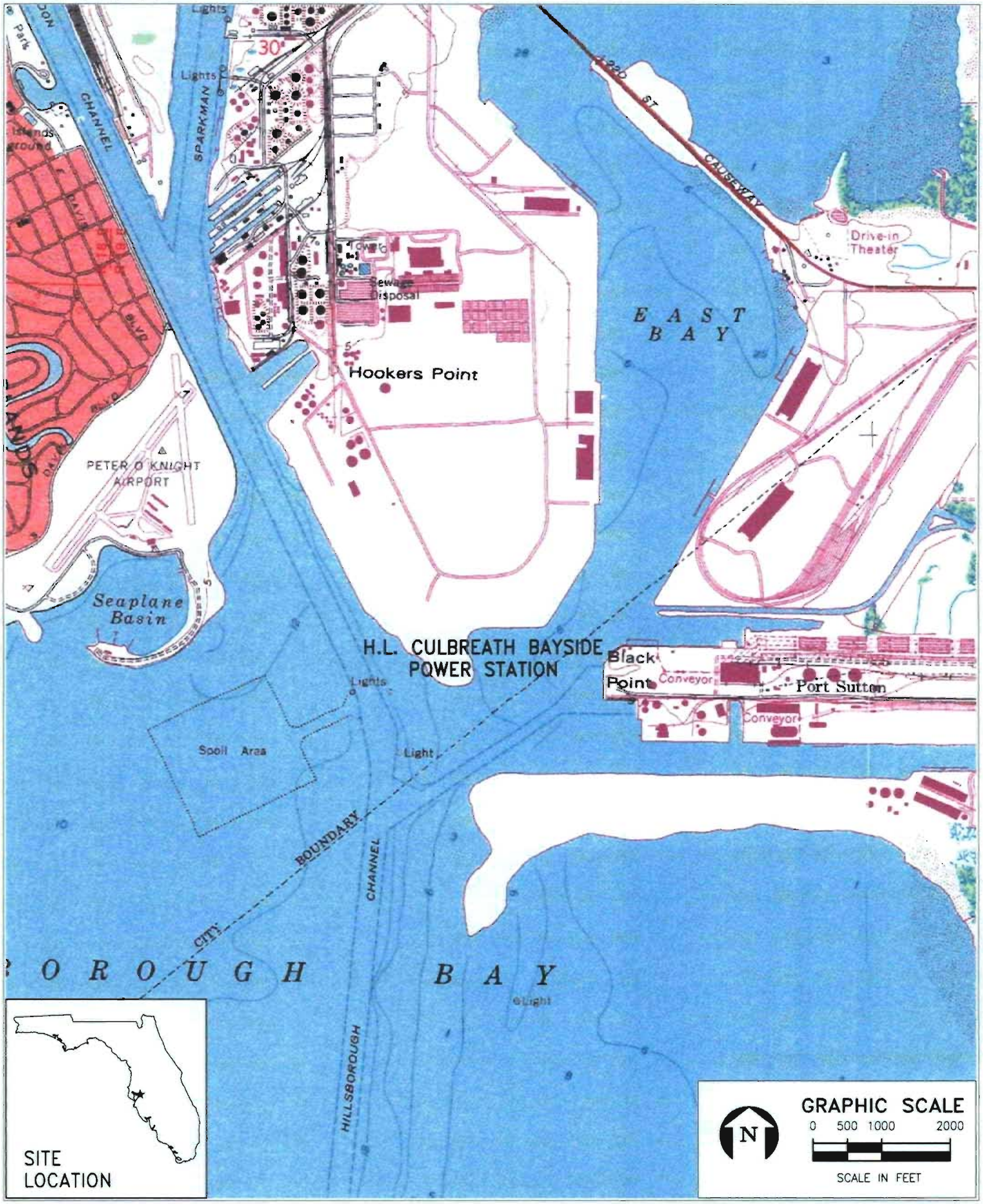

FIGURE 2-1.

H.L. CULBREATH BAYSIDE POWER STATION LOCATION AND SURROUNDINGS

Source: USGS Quad: Tampa, FL, 1981; ECT, 2008.

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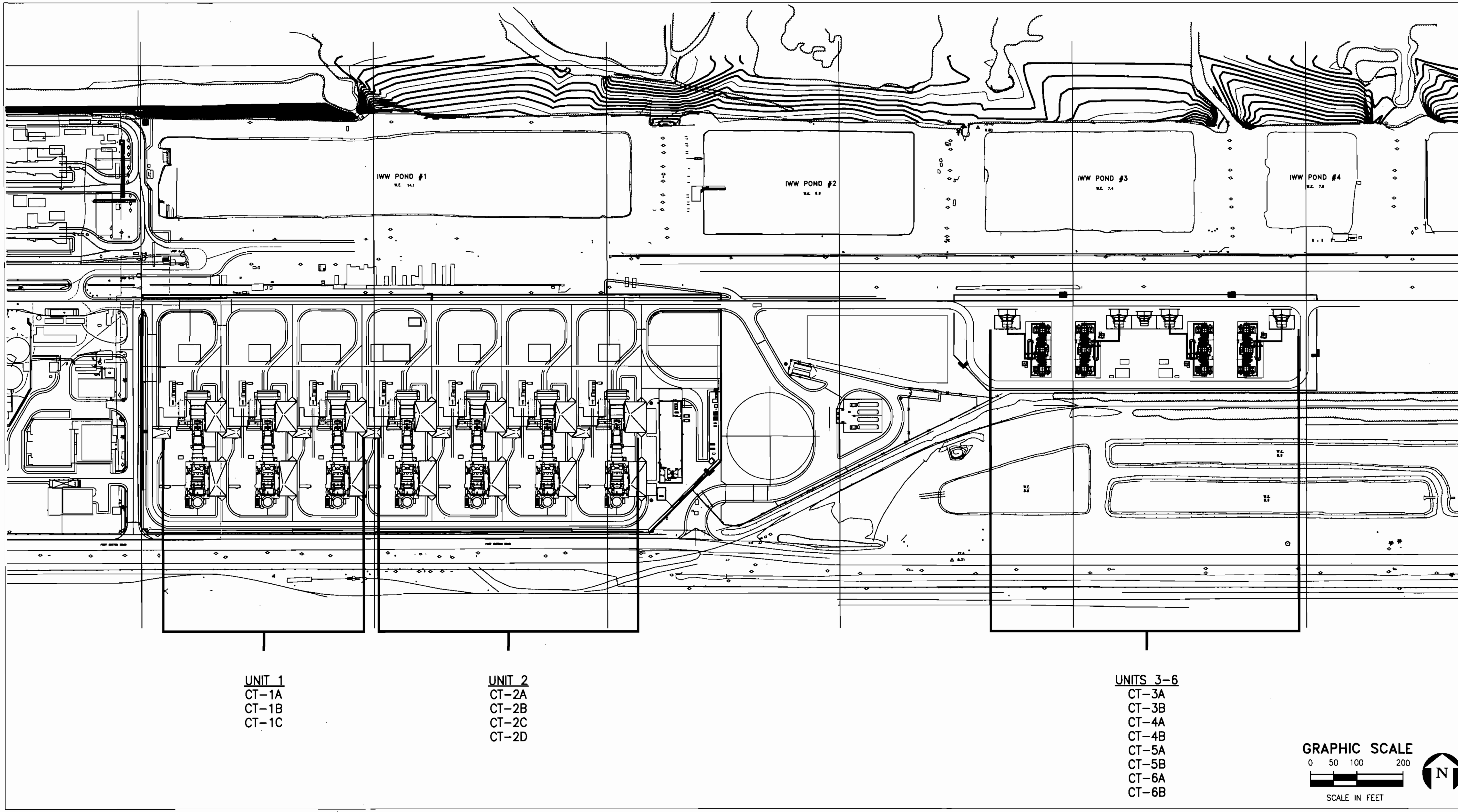

FIGURE 2-2.
H. L. CULBREATH BAYSIDE POWER STATION
UNITS 1, 2, AND 3-6 PLOT PLAN
Sources: Black & Veatch Co., 2008; ECT, 2008.

TAMPA ELECTRIC

M:\acad\071286\Plot plan Unit 3-6.dwg

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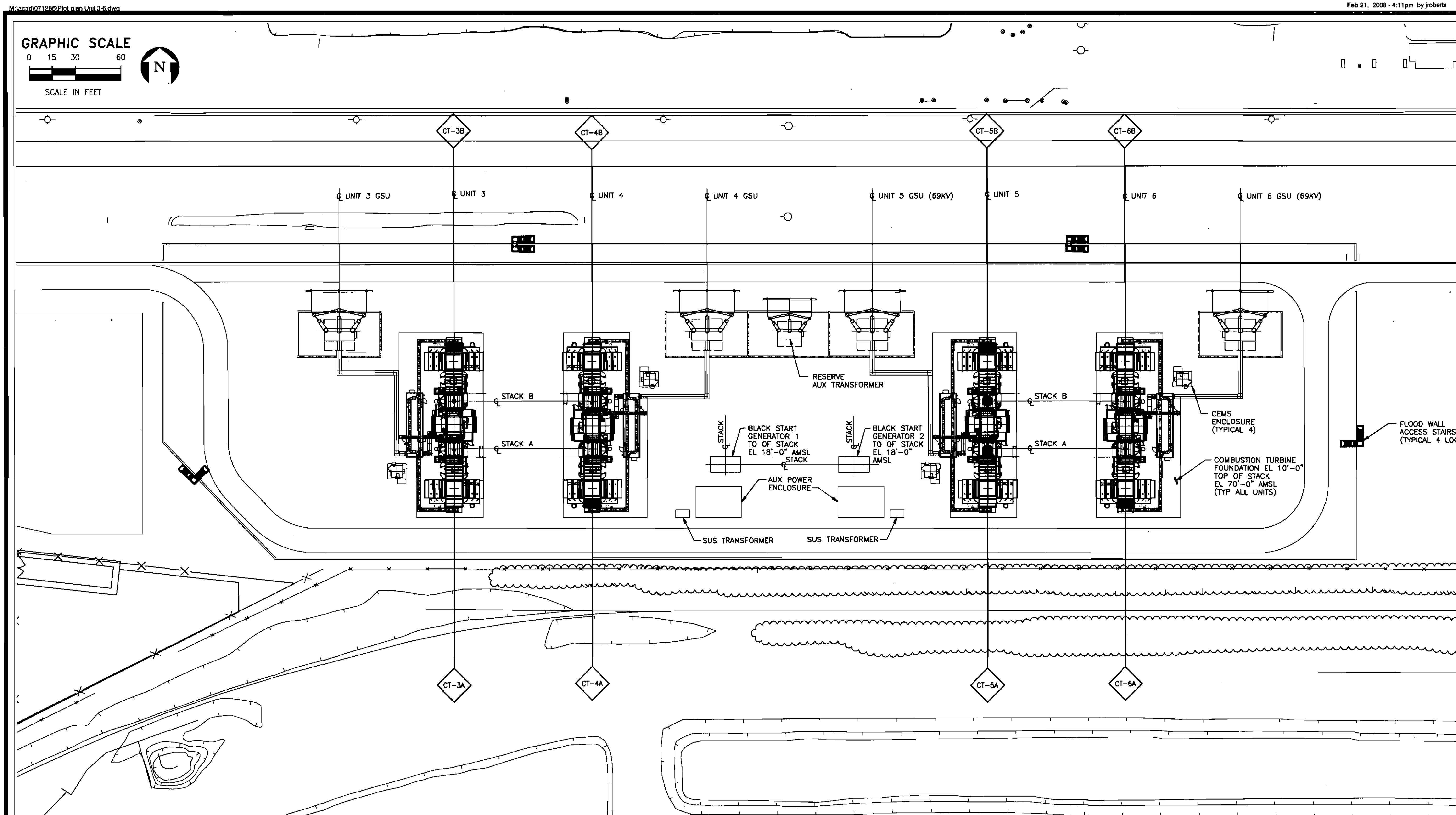

FIGURE 2-3.

H. L. CULBREATH BAYSIDE POWER STATION

UNITS 3-6 PLOT PLAN

Sources: Black & Veatch Co., 2008; ECT, 2008.

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Port Sutton Road on the south side of the site. The BPS entrance has security to control site access.

2.2 PROCESS DESCRIPTION AND PROCESS FLOW DIAGRAM

The proposed BPS SCCT project will include four nominal 62-MW PWPS FT8-3® SWIFTPAC® units. Figure 2-4 presents a process flow diagram of the SCCT project.

CTs are heat engines that convert latent fuel energy into work using compressed hot gas as the working medium. CTs deliver mechanical output by means of a rotating shaft used to drive an electrical generator, thereby converting a portion of the engine's mechanical output to electrical energy. Ambient air is first filtered and then compressed by the CT compressor. At ambient temperatures above approximately 59°F, inlet air evaporative cooling (i.e., "fogging") may be used to lower the inlet air temperature and provide additional electrical power. The CT compressor increases the pressure of the combustion air stream and also raises its temperature. The compressed combustion air is then combined with natural gas fuel and burned in the CT's high-pressure combustors to produce hot exhaust gases. These high-pressure, hot gases expand and turn the CT's turbine to produce rotary shaft power, which is used to drive an electric generator as well as the CT combustion air compressor.

Normal operation is expected to consist of the SCCTs operating at rated load. Alternate operating modes include reduced load operation (i.e., between 50 and 100 percent of rated load) and inlet air evaporative cooling depending on power demands. As noted previously, the SCCTs will operate in peaking service for no more than 3,500 hr/yr per SCCT.

The aeroderivative SCCTs will utilize water injection to control NO_x air emissions. The use of low-sulfur natural gas in the SCCTs will minimize PM/PM_{10}, SO_2, and H_2SO_4 mist air emissions. Oxidation catalyst will be employed to control CO and VOC emissions.

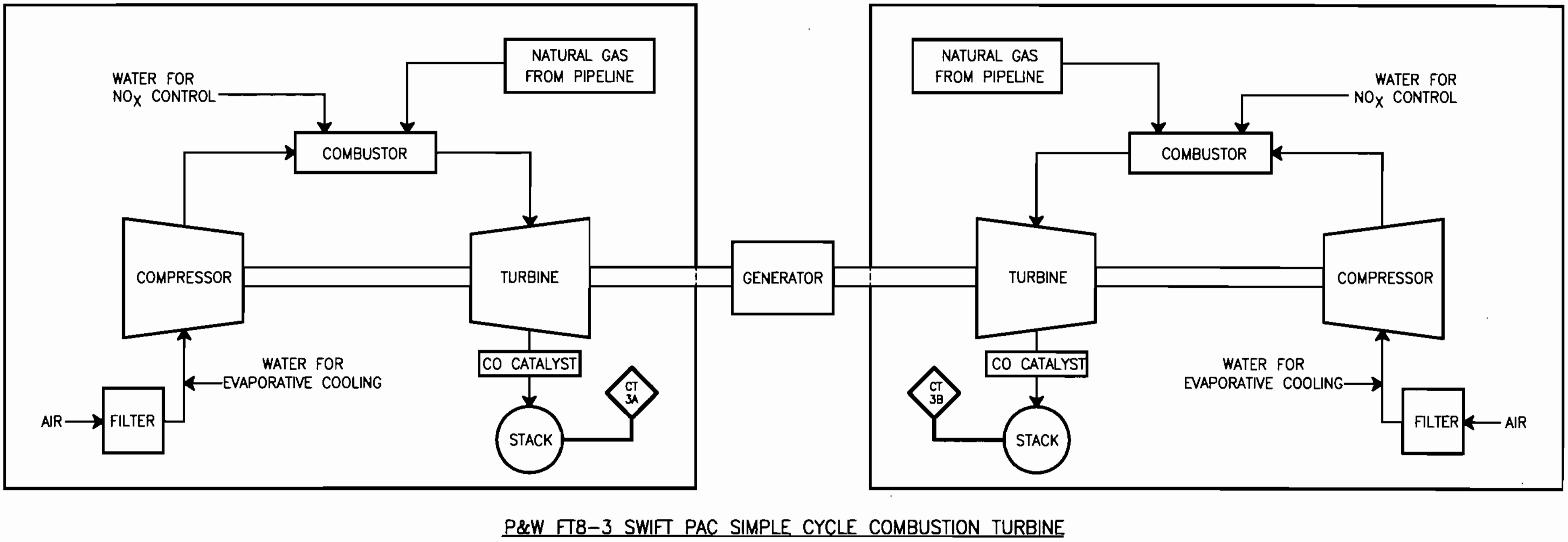

FIGURE 2-4.
BPS----P&W SCCT PROCESS FLOW DIAGRAM

Source: ECT, 2008.

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2.3 EMISSION AND STACK PARAMETERS

Tables 2-1 and 2-2 provide maximum hourly criteria pollutant and H_2SO_4 mist SCCT emissions rates, respectively. Table 2-3 provides maximum hourly organic hazardous air pollutant emission rates. The highest hourly emissions rates for each pollutant are shown, taking into account load and ambient temperature to develop maximum hourly emissions estimates for each SCCT. Noncriteria pollutants consist primarily of trace amounts of organic compounds associated with the combustion of natural gas.

Maximum hourly emissions rates for all pollutants, in units of pounds per hour (lb/hr), are projected to occur for CT operations at low ambient temperature (i.e., 20 degrees Fahrenheit [°F]) and full load. Appendix B provides the bases for these emissions rates.

Table 2-4 presents projected maximum annualized criteria and noncriteria emissions for the BPS SCCT project. For the SCCTS, the annual profile assumes full load operation for 3,500 hr/yr at an ambient temperature of 59°F with inlet air evaporative cooling. This represents a conservative estimate of annual emission rates since the annual average temperature for the Tampa Bay area is 72°F.

Table 2-5 provides stack parameters for the SCCTs. Stack parameters for the emergency diesel engines are shown in Table 2-6.

Table 2-1. Maximum Criteria Pollutant Emission Rates for Three SCCT Loads and Three Ambient Temperatures (per SCCT)

SCCT Load (%)	Ambient Temperature (°F)	PM/PM_{10}*		SO_2		NO_x		CO		VOC		Lead	
		lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
100	20	2.5	0.32	1.87	0.24	31.6	3.98	6.2	0.77	1.3	0.16	Neg.	Neg.
	59†	2.5	0.32	1.89	0.24	32.0	4.03	4.7	0.59	1.4	0.17	Neg.	Neg.
	90†	2.5	0.32	1.79	0.23	30.2	3.81	4.4	0.56	1.3	0.16	Neg.	Neg.
75	20	2.5	0.32	1.45	0.18	24.4	3.07	8.4	1.05	2.7	0.33	Neg.	Neg.
	59†	2.5	0.32	1.47	0.19	24.8	3.12	7.0	0.89	1.9	0.24	Neg.	Neg.
	90†	2.5	0.32	1.41	0.18	23.7	2.99	5.4	0.68	1.3	0.16	Neg.	Neg.
50	20	2.5	0.32	1.06	0.13	18.2	2.29	9.1	1.15	5.1	0.64	Neg.	Neg.
	59†	2.5	0.32	1.08	0.14	18.2	2.29	6.6	0.83	2.2	0.27	Neg.	Neg.
	90†	2.5	0.32	1.04	0.13	17.5	2.21	6.1	0.77	2.0	0.25	Neg.	Neg.

Note: g/s = gram per second.
lb/hr = pound per hour.
Neg. = negligible

*Excludes H_2SO_4 mist.
†Emission rates reflect the use of evaporative cooling at ambient temperatures above approximately 59°F.

Sources: ECT, 2008.
PWPS, 2008.

Table 2-2. Maximum H_2SO_4 Mist Pollutant Emissions Rates for Three SCCT Loads and Three Ambient Temperatures (per SCCT)

SCCT Load (%)	Ambient Temperature (°F)	H_2SO_4 Mist	
		lb/hr	g/s
100	20	0.21	0.027
	59*	0.21	0.027
	90*	0.20	0.025
75	20	0.16	0.021
	59*	0.17	0.021
	90*	0.16	0.020
50	20	0.12	0.015
	59*	0.12	0.015
	90*	0.12	0.015

*Emission rates reflect the use of evaporative cooler at ambient temperatures above approximately 65°F.

Sources: ECT, 2008
PWPS, 2008.

Table 2-3. Maximum Organic Hazardous Air Pollutant Emission Rates for 100-Percent SCCT Load and Three Ambient Temperatures (per SCCT)

SCCT Load (%)	Ambient Temperature (°F)	1,3-Butadiene		Acetaldehyde		Acrolein		Benzene		Ethylbenzene		Formaldehyde	
		lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
100	20	7.28E-05	9.17E-06	6.77E-03	8.53E-04	1.08E-03	1.37E-04	2.03E-03	2.56E-04	5.42E-03	6.83E-04	1.20E-01	1.51E-02
	59*	7.37E-05	9.28E-06	6.85E-03	8.64E-04	1.10E-03	1.38E-04	2.06E-03	2.59E-04	5.48E-03	6.91E-04	1.22E-01	1.53E-02
	90*	6.95E-05	8.76E-06	6.47E-03	8.15E-04	1.03E-03	1.30E-04	1.94E-03	2.44E-04	5.17E-03	6.52E-04	1.15E-01	1.45E-02

Unit Load (%)	Ambient Temperature (°F)	Naphthalene		Polycyclic Organic Matter		Propylene Oxide		Toluene		Xylene	
		lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
100	20	2.20E-04	2.77E-05	3.72E-04	4.69E-05	4.91E-03	6.19E-04	2.20E-02	2.77E-03	1.08E-02	1.37E-03
	59*	2.23E-04	2.81E-05	3.77E-04	4.75E-05	4.97E-03	6.26E-04	2.23E-02	2.81E-03	1.10E-02	1.38E-03
	90*	2.10E-04	2.65E-05	3.56E-04	4.48E-05	4.69E-03	5.91E-04	2.10E-02	2.65E-03	1.03E-02	1.30E-03

Note: Neg. = negligible

*Emission rates reflect the use of evaporative cooling at ambient temperatures above approximately 59°F.

Source: ECT, 2008.

Table 2-4. Maximum Annualized Emissions Rates (tpy)

Pollutant	SCCT Project
NO_x	449.6
CO	65.4
PM/PM_{10}*	35.0
SO_2	26.5
VOC	18.9
H_2SO_4 mist	3.0
1,3-Butadiene	0.0010
Acetaldehyde	0.096
Acrolein	0.015
Arsenic	0.00094
Benzene	0.029
Beryllium	0.000056
Cadmium	0.0052
Chromium	0.0066
Ethylbenzene	0.077
Formaldehyde	1.7
Lead	0.0024
Manganese	0.0018
Mercury	0.0012
Naphthalene	0.0031
Nickel	0.0099
PAHs	0.0053
Propylene oxide	0.070
Selenium	0.00011
Toluene	0.31
Xylene	0.15
Total HAPs	2.5

*Filterable and condensable particulate matter.

Sources: ECT, 2008.
PWPS, 2008.
TEC, 2008.

Table 2-5. Stack Parameters for Three SCCT Loads and Three Ambient Temperatures (Per SCCT)

Unit Load (%)	Ambient Temperature (°F)	Stack Height		Stack Exit Temperature		Stack Exit Velocity		Stack Diameter	
		ft	meters	°F	K	ft/sec	m/sec	ft	meters
100	20	60.0	18.3	828	715	99.6	30.4	9.5	2.90
	59*	60.0	18.3	893	752	101.3	30.9	9.5	2.90
	90*	60.0	18.3	917	765	97.6	29.8	9.5	2.90
75	20	60.0	18.3	748	671	83.3	25.4	9.5	2.90
	59*	60.0	18.3	817	709	84.8	25.9	9.5	2.90
	90*	60.0	18.3	864	735	82.3	25.1	9.5	2.90
50	20	60.0	18.3	701	645	67.7	20.6	9.5	2.90
	59*	60.0	18.3	767	682	68.2	20.8	9.5	2.90
	90*	60.0	18.3	814	708	66.7	20.3	9.5	2.90

*Stack data reflect the use of evaporative cooling at ambient temperatures above approximately 59°F.

Note: K = Kelvin.
ft/sec = foot per second.
m/sec = meter per second.

Sources: PWPS, 2008.
ECT, 2008.

Table 2-6. Stack Parameters for Emergency Generator Diesel Engines

Exhaust Parameter	Emergency Generator (Per Engine)
Height (ft)	15
Diameter (ft)	0.67
Exit temperature (°F)	955
Flow Rate (acfm)	6,046
Exit velocity (ft/s)	288.7

Sources: Caterpillar, 2007.
ECT, 2008.

3.0 AIR QUALITY STANDARDS AND NEW SOURCE REVIEW APPLICABILITY

3.1 NATIONAL AND STATE AAQS

As a result of the 1977 Clean Air Act (CAA) Amendments (1990), the EPA has enacted primary and secondary national ambient air quality standards (NAAQS) for six air pollutants (Chapter 40, Part 50, CFR). Primary NAAQS are intended to protect the public health, and secondary NAAQS are intended to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Florida has also adopted ambient air quality standards (AAQS) (reference Section 62-204.240, F.A.C.). Table 3-1 presents the current national and Florida AAQS.

Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements. The BPS is located south of downtown Tampa in Hillsborough County. Hillsborough County is presently designated in 40 CFR 81.310 as *cannot be classified* for SO_2, and for total suspended particulates [TSPs] for that portion of Hillsborough County which falls within the area of a circle having a centerpoint at the intersection of U.S. Highway 41 South and State Road 60 and a radius of 12 kilometers [km]. Hillsborough County is designated *unclassifiable/attainment* for CO, ozone (1-hour and 8-hour standards), and particulate matter with an aerodynamic diameter equal to or less than a nominal 2.5 microns ($PM_{2.5}$), and designated *cannot be classified or better than national standards* for nitrogen dioxide (NO_2). For lead, Hillsborough County is designated *unclassifiable* for the area encompassed within a radius of 5 km centered on universal transverse mercator [UTM] coordinates: 364.0 km east, 3,093.5 km north, Zone 17, in the city of Tampa.

Table 3-1. National and Florida Air Quality Standards (micrograms per cubic meter [$\mu g/m^3$] unless otherwise stated)

Pollutant (units)	Averaging Periods	National Standards Primary	National Standards Secondary	Florida Standards
SO_2	3-hour[1]		1,300	1,300
	24-hour[1]	365		260
	Annual[2]	80		60
PM_{10}	24-hour[3]	150	150	150
	Annual[4]			50
$PM_{2.5}$	24-hour[5]	35	35	
	Annual[6]	15	15	
CO	1-hour[1]	40,000		40,000
	8-hour[1]	10,000		10,000
Ozone (ppmv)	1-hour[7]			0.12
	8-hour[8]	0.075	0.075	
NO_2	Annual[2]	100	100	100
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	1.5

[1]Not to be exceeded more than once per calendar year.
[2]Arithmetic mean.
[3]The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$, as determined in accordance with 40 CFR 50 Appendix K, is equal to or less than one.
[4]The standards are attained when the expected annual arithmetic mean concentration, as determined in accordance with 40 CFR 50 Appendix K, is less than or equal to 50 $\mu g/m^3$.
[5]98th percentile concentration, as determined in accordance with 40 CFR 50 Appendix N.
[6]Arithmetic mean concentration, as determined in accordance with 40 CFR 50 Appendix N.
[7]Standard attained when the expected number of calendar days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1, as determined by 40 CFR 50, Appendix H.
[8]Standard attained when the average of the annual 4th highest daily maximum 8-hour average concentrations over a 3-year period are less than or equal to the standard, as determined by 40 CFR 50, Appendix I. The 8-hour ozone standard was reduced from 0.08 to 0.075 ppmv on March 12, 2008.

Sources: 40 CFR 50.
Section 62-204.240, F.A.C.

Hillsborough County is designated attainment (for ozone, CO, and NO_2) and unclassifiable (for SO_2, PM_{10}, and lead) by Section 62-204.340, F.A.C. Hillsborough County is also classified as an air quality maintenance area for ozone (entire county), for PM (that portion of Hillsborough County which falls within the area of a circle having a centerpoint at the intersection of U.S. Highway 41 South and State Road 60 and a radius of 12 km), and for lead (the area encompassed within a radius of 5 km centered on UTM coordinates: 364.0 km east, 3,093.5 km north, Zone 17) by Section 62-204.340, F.A.C.

Although the Florida rules currently include a 1-hour ozone AAQS (reference Rule 62-204.240[4], F.A.C.), on the federal level EPA revoked this standard in Florida effective June 15, 2005. FDEP plans to adopt both the 8-hour ozone and $PM_{2.5}$ NAAQS and remove the 1-hour ozone AAQS in a single rulemaking project.

3.2 NONATTAINMENT NSR APPLICABILITY

The BPS is located in Hillsborough County. As noted previously, Hillsborough County is presently designated as either better than national standards or unclassifiable/attainment for all criteria pollutants. Accordingly, the BPS SCCT project is not subject to the nonattainment NSR requirements of Section 62-212.500, F.A.C.

3.3 PSD NSR APPLICABILITY

An assessment of PSD applicability was conducted using the procedures specified in the TEC/ EPA Consent Decree—this assessment is provided in Appendix C. Comparisons of the net change in annual emission rates for the SCCT project and the PSD significant emission rate thresholds are provided in Table 3-2. As shown in this table, the net change in emissions for each pollutant is below the applicable PSD significant emission rate level. Accordingly, the BPS SCCT Project is not subject to the PSD NSR requirements of Section 62-212.400, F.A.C. Detailed potential emission rate estimates for the BPS SCCT project are provided in Appendix B.

Table 3-2. Projected SCCT Project Emissions Compared to PSD Significant Emission Rates

Pollutant	Net Change In Annual Emissions* (tpy)	PSD Significant Emission Rate (tpy)	PSD Applicability
NO_x	-492.4	40	No
CO	65.4	100	No
PM	2.3	25	No
PM_{10}	2.3	15	No
SO_2	26.5	40	No
Ozone/VOC	18.9	40	No
Lead	0.0024	0.6	No
Mercury	Negligible	0.1	No
Total fluorides	Not present	3	No
H_2SO_4 mist	3.0	7	No
Total reduced sulfur (S) (including hydrogen sulfide [H_2S])	Not present	10	No
Reduced sulfur compounds (including H_2S)	Not present	10	No
Municipal waste combustor acid gases (measured as SO_2 and hydrogen chloride [HCl])	Not present	40	No
Municipal waste combustor metals (measured as PM)	Not present	15	No
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	Not present	3.5×10^{-6}	No
For the pollutants listed above, and for major stationary sources locating within 10 km of a Class I area having an impact equal to or greater than 1 $\mu g/m^3$, 24-hour average	N/A	Any amount	No

* Emission rates shown for CO, SO_2, VOC, lead, and H_2SO_4 mist represent potential annual rates for the BPS SCCT project without consideration of netting per the TEC/EPA Consent Decree.

Sources: Rule 62-210.200(278), F.A.C.
ECT, 2008.
TEC, 2008.
PWPS, 2008.

3.4 HAZARDOUS AIR POLLUTANT REQUIREMENTS

Florida relies on the requirements of the CAA with respect to the regulation of hazardous (also known as toxic) air pollutants. These federal requirements include a comprehensive set of technology-based emission standards referred to as NESHAPs. These standards establish hazardous air pollutant emission limitations for a wide variety of industrial source categories. Recent NESHAPs (i.e., those adopted after the 1990 amendments to the CAA) reflect maximum achievable control technology (MACT). Section 4.2 provides a discussion of the NESHAPs program and its applicability to the SCCT project.

4.0 STATE AND FEDERAL EMISSION STANDARDS

4.1 NEW SOURCE PERFORMANCE STANDARDS (NSPS)

Section 111 of the CAA, Standards of Performance of New Stationary Sources, requires EPA establish federal emission standards for source categories that cause or contribute significantly to air pollution. These standards are intended to promote use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements. These standards apply to sources that have been constructed or modified since the proposal of the standard. Since December 23, 1971, EPA has promulgated more than 75 standards. The NSPS are codified in the Code of Federal Regulations at 40 CFR 60.

The BPS SCCT project will include eight SCCTs and two emergency generator diesel engines. These SCCTs and diesel engines will be subject to the applicable requirements of NSPS Subparts KKKK and IIII, respectively, as discussed in the following sections.

NSPS SUBPART KKKK—STATIONARY COMBUSTION TURBINES

Subpart KKKK establishes emission limits for CT/HRSG units that commenced construction after February 18, 2005, and that have a heat input at peak load equal to greater than 10.7 gigajoules (10 million British thermal units per hour[MMBtu/hr]) based on the higher heating value (HHV) of the fuel.

The BPS SCCTs will be fired exclusively with natural gas for up to 2,500 hr/yr. NSPS Subpart KKKK specifies emission limitations, monitoring, reporting, and recordkeeping requirements for NO_x and SO_2. Applicable NSPS Subpart KKKK emission standards for the SCCTs units are summarized as follows:

- $\underline{NO_x}$—25 ppmvd at 15 percent O_2, or 1.2 pounds per megawatt hour (lb/MWh) gross energy output.
- $\underline{SO_2}$—0.90 lb/MWh gross energy output, or 0.060 lb/MMBtu.

The BPS SCCTs will comply with the applicable requirements of NSPS Subpart KKKK.

NSPS SUBPART IIII—STATIONARY COMPRESSION IGNITION INTERNAL COMBUSTION ENGINES

NSPS Subpart IIII is applicable to owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005, where the CI ICE are manufactured after April 1, 2006 (and are not fire pump engines), or manufactured after July 1, 2006 (for certified National Fire Protection Association fire pump engines).

NSPS Subpart IIII specifies emission limitations, monitoring, reporting and recordkeeping requirements for NO_x, CO, nonmethane hydrocarbons (NMHC), and PM. Applicable NSPS Subpart IIII emission standards for the Bayside emergency diesel generator CI ICEs are summarized as follows:

- Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.
- Owners and operators of emergency stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder must: (a) reduce NO_x emissions by 90 percent or more, or limit the emissions of NO_x in the stationary CI internal combustion engine exhaust to 1.6 grams per KW-hour (1.2 grams per HP-hour), and (b) reduce PM emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 grams per horsepower-hour [g/HP-hr]).

The Bayside emergency diesel engines will have a displacement of less than 30 liters per cylinder and will comply with the applicable requirements of NSPS Subpart IIII.

4.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

The provisions of the CAA that address the control of HAP emissions, or air toxics, are found in Section 112. Section 112 of the CAA includes provisions for the promulgation of NESHAPs, or MACT standards, as well as several related programs to enhance and support the NESHAPs program. Section 112 requires EPA to publish and regularly update (at least every 8 years) a list of all categories and subcategories of major and area sources that emit HAPs. The Section 112(c) list of source categories was initially published in the Federal Register (FR) on July 16, 1992, and has been periodically revised thereafter. EPA must promulgate regulations establishing emission standards (NESHAPs) for each category or subcategory of major sources and area sources of HAPs that are listed pursuant to Section 112(c). The standards must require the maximum degree of emission reduction that EPA determines to be achievable by each particular source category. Different criteria for MACT apply for new and existing sources. Less stringent standards, known as generally available control technology (GACT) standards, are allowed at the EPA Administrator's discretion for area sources.

As required by Section 112 of the CAA, EPA promulgated a final NESHAPs for stationary combustion turbines (40 CFR 63, Subpart YYYY) on March 5, 2004. However, the 40 CFR 63 NESHAPS are only applicable to *major* HAP sources (i.e., facilities that have potential emissions of any individual HAP of 10 tpy or more, and potential emissions of total HAPs of 25 tpy or more). The BPS, including the SCCT project, will have potential HAP emission rates below these thresholds and, therefore, is a minor source of HAPs. Accordingly, the 40 CFR 63 NESHAPS are not applicable to the BPS emission sources, including the SCCT project. In addition, the effectiveness of Subpart YYYY was stayed by EPA on August 18, 2004, for diffusion flame gas-fired turbines—the type of turbine proposed for the BPS SCCT project.

NESHAPS Subpart ZZZZ applies to new stationary reciprocating internal combustion engines (RICE) with a site-rating of more than 500 brake horsepower (bhp) that commence construction after December 19, 2002. New RICE that operate exclusively as emergency units are subject only to initial notification requirements. However, Subpart ZZZZ is only applicable to RICE located at major sources of HAP emissions. Accordingly, Subpart ZZZZ of 40 CFR 63 NESHAPS is not applicable to the Bayside emergency generator diesel engines.

4.3 ACID RAIN PROGRAM

The overall goal of the acid rain program (ARP) is to achieve significant environmental and public health benefits through reductions in emissions of SO_2 and NO_x, the primary causes of acid rain. To achieve this goal at the lowest cost to society, the program employs both traditional and innovative, market-based approaches for controlling air pollution. In addition, the program encourages energy efficiency and pollution prevention.

Title IV of the CAA sets a goal of reducing annual SO_2 emissions by 10 million tons below 1980 levels. To achieve these reductions, the law required a two-phase tightening of the restrictions placed on fossil fuel-fired power plants. Phase I began in 1995 and affected 263 units at 110 mostly coal-burning electric utility plants located in 21 eastern and midwestern states. An additional 182 units joined Phase I of the program as substitution or compensating units, bringing the total of Phase I affected units to 445. Phase II, which began in the year 2000, tightened the annual emissions limits imposed on these large, higher emitting plants and also set restrictions on smaller, cleaner plants fired by coal, oil, and gas, encompassing more than 2,000 units in all. The program affects existing utility units serving generators with an output capacity of greater than 25 MW and all new utility units.

For SO_2, the ARP introduced an allowance trading system that harnesses the incentives of the free market to reduce pollution. Under this cap-and-trade program, affected existing utility units (i.e., those in operation prior to November 15, 1990) are allocated allowances based on their historical fuel consumption and a specific emission rate. Each allowance permits a unit to emit 1 ton of SO_2 during or after a specified year. For each ton of SO_2 emitted in a given year, one allowance is retired, that is, it can no longer be used. Allowances may be bought, sold, or banked. Anyone may acquire allowances and participate in the trading system. However, regardless of the number of allowances a source holds, it may not emit at levels that would violate federal or state limits set under Title I of the

CAA to protect public health. During Phase II of the program (now in effect), the CAA set a permanent ceiling (or cap) of 8.95 million allowances for total annual SO_2 allowance allocations to utilities. This cap firmly restricts emissions and ensures that environmental benefits will be achieved and maintained. New utility units (i.e., those that commence operation on and after November 15, 1990) are not allocated any SO_2 allowances and must obtain such allowances annually from the ARP SO_2 allowance market in amounts equal to their actual SO_2 emission rates.

The CAA also required a 2-million-ton reduction in NO_x emissions by the year 2000. A significant portion of this reduction has been achieved by coal-fired utility boilers that will be required to install low NO_x burner technologies and to meet new emissions standards. The ARP NO_x emission reduction requirements are only applicable to existing utility units (i.e., those in operation prior to November 15, 1990).

The BPS SCCTs will be subject to the ARP since they will be *new utility units* (i.e., will commence operation after November 15, 1990) and will serve a generator that produces electricity for sale. As noted previously, new utility units do not receive any SO_2 allowance allocations. Accordingly, TEC will need to annually obtain SO_2 allowances from the ARP SO_2 allowance market in amounts equal to the SCCT's actual SO_2 emission rates. The NO_x component of the ARP does not apply to new utility units.

4.4 CLEAN AIR INTERSTATE RULE

On March 10, 2005, EPA issued the final Clean Air Interstate Rule (CAIR). The objective of CAIR is to assist states with $PM_{2.5}$ and 8-hour ozone nonattainment areas to achieve attainment by reducing precursor emissions at sources located in 28 states (including Florida) situated upwind of these nonattainment areas. Based on regional dispersion modeling, EPA determined that these 28 upwind states significantly contribute to $PM_{2.5}$ and 8-hour ozone nonattainment in downwind areas. Florida emission sources are projected to significantly contribute to $PM_{2.5}$ nonattainment areas located in Georgia (Macon and Atlanta) and Alabama (Birmingham) and to an 8-hour ozone nonattainment area in Georgia (Atlanta).

The CAIR reductions of precursor emissions address annual SO_2 and NO_x emissions (for reductions in annual and daily average ambient $PM_{2.5}$ impacts) and ozone season (May through September) NO_x emissions (for reductions in 8-hour average ambient ozone impacts). The SO_2 and NO_x reductions will be implemented by means of a regional two-phase cap-and-trade program. For SO_2, the first cap begins in calendar year 2010 and extends through 2014. For NO_x, the first cap begins in calendar year 2009 and also extends through 2014. The second phase cap for both pollutants becomes effective in calendar year 2015 and thereafter. The SO_2 caps will reduce current ARP SO_2 emissions by 50 percent in Phase I and by 65 percent in Phase II. The NO_x caps reflect NO_x emission rates of 0.15 and 0.125 lb/MMBtu for the first and second phase caps, respectively.

For each phase cap, CAIR assigns SO_2 and NO_x emission budgets (in units of tpy) and in units of tons per ozone season) to each affected upwind state. These state emission budgets were developed by EPA based on the application of cost-effective control technologies (i.e., flue gas desulfurization [FGD]) for SO_2 and SCR for NO_x. The affected states were required to submit revised state implementation plans (SIPs) within 18 months (i.e., by September 11, 2006) for EPA review and approval. Florida's proposed SIP revisions implementing CAIR were submitted to EPA Region 4 on March 16, 2007, for review and approval in accordance with EPA's abbreviated SIP approval process. The SIPs will provide details as to the procedures that will be used to allocate the state NO_x and SO_2 budgets to individual sources.

Following SIP approval and allocation of the state SO_2 and NO_x budgets to individual emission sources, emission units at these sources must possess sufficient SO_2 and NO_x allowances such that actual emissions (as measured by continuous emissions monitoring system [CEMS]) do not exceed the allocations for each control period beginning in 2009 (for NO_x) and 2010 (for SO_2). Sources that have actual emissions in excess of their allocation will need to reduce actual emission rates or purchase additional allowances on the open market. Emission sources that have surplus allowances may bank the allowances for use in any future control period or sell the surplus allowances on the open market.

Florida has adopted EPA's 40 CFR 96 CAIR NO_x and SO_2 Trading Programs for State Implementation Plans by reference in Section 62-204.800, F.A.C. Florida's implementation of the Federal CAIR is set forth at Section 62-296.470, F.A.C.

EPA's model NO_x trading program includes provisions for allocating NO_x allowances to new utility units (those that are placed in service in 2001 or later) such as the BPS SCCTs (i.e., a new source set-aside). Similar to the ARP, there are no provisions for a new source set-aside with respect to CAIR SO_2 allowances. For NO_x allowances, new units will be allocated allowances from the new source set-aside until they have established a baseline and are included in the shared pool. NO_x allowance allocations from the new source set-aside pool will be made to new utility units on a pro-rata basis.

In a July 11, 2008, Opinion, the U.S. Court of Appeals for the District of Columbia Circuit addressed petitions regarding the CAIR. The petitions challenged various CAIR provisions including: (a) use of a regional cap and trade program to prevent 8-hour ozone and $PM_{2.5}$ NAAQS exceedances; (b) CAIR Phase II compliance deadline of 2015; (c) air quality impact level used to determine a significant impact with respect to the $PM_{2.5}$ NAAQS; (d) CAIR SO_2 and NO_x budgets, including use of fuel adjustment factors in allocating NO_x allowances; (e) retirement of Acid Rain Program SO_2 allowances; (f) inclusion of Florida, Texas, and Minnesota in the CAIR program; and (g) CAIR Phase I deadline of 2009.

The Court ruled in favor of the petitioners on most issues. The Court upheld EPA with respect to the $PM_{2.5}$ significant air quality impact level, the inclusion of Florida and Texas in the CAIR program, and the 2009 Phase I deadline. However, the Court vacated CAIR in its entirety stating that EPA's approach of region-wide emissions caps was fundamentally flawed and that EPA must completely redo its CAIR analysis. The Court further ruled that the CAIR emissions trading program was unlawful. The Court also vacated EPA's CAIR Federal Implementation Plan (FIP). The Court remanded both CAIR and the associated FIP to EPA. The Court noted that the NO_x SIP Call program would remain in effect.

The Court Opinion will not go into effect until the court issues its mandate, which will officially vacate CAIR and direct EPA to take actions consistent with the Opinion. Typically, the court withholds its mandate until seven days after the deadline for the parties to file petitions for rehearing (i.e., August 25th for the CAIR Opinion). If a party petitions for rehearing in the D.C. Circuit or asks the Supreme Court to hear the case, the issuance of the mandate may be delayed even further. However, a party may also request that the Court accelerate issuance of the mandate which, if granted, would immediately implement the Court's decision. Such a request was recently made and granted with respect to the recent Clean Air Mercury Rule and the Delisting Rule Court Opinion.

4.5 CLEAN AIR MERCURY RULE

On March 15, 2005, EPA issued the final Clean Air Mercury Rule (CAMR). The purpose of CAMR is to reduce national coal-fired power plant mercury emissions from the current level of 48 to 15 tpy by means of a two-phase cap-and trade program. The first phase national mercury cap (with a cap of 38 tpy) becomes effective in 2010 while the second 15-tpy cap becomes effective in 2018 and thereafter.

CAMR also establishes stack mercury emission standards applicable to new sources (i.e., those constructed, modified, or reconstructed after January 30, 2004.) Similar to CAIR, CAMR assigns mercury budgets (in units of tpy) to each state for each phase cap. The first phase mercury cap represents the cobenefits that will be achieved by CAIR (i.e., installation of FGD and SCR controls). The second phase mercury cap is based on the cumulative effect of FGD/SCR cobenefits and on EPA projections regarding the availability and removal efficiency of future mercury controls (e.g., activated carbon injection [ACI]).

The NSPS program serves as the regulatory authority for CAMR. Accordingly, the revisions to NSPS Subpart Da were effective upon proposal (i.e., January 30, 2004). CAMR also includes a new NSPS, Subpart HHHH, which contains EPA's model mercury trading program. Under the terms of revised NSPS Subpart Da, states must submit plans by November 17, 2006, that address the state EGU mercury caps for 2010 and 2018 for EPA review and approval. The state plans will provide details as to the procedures that will be used to allocate the state mercury budgets to individual coal-fired utility units. For each control period, sufficient mercury allowances must be held to cover the actual mercury emissions for all mercury budget units at a source. Although mercury allowances will be allocated on a unit-by-unit basis, compliance with the CAMR mercury allowance program is determined on a plant-wide basis.

As described previously for the CAIR state SO_2 and NO_x budgets, following SIP approval and allocation of the state mercury budgets to individual emission sources, these sources must possess sufficient mercury allowances to cover their actual emission rates (as continuously measured either by CEMS or sorbent trap monitoring systems) for each control period beginning in 2010. Emission sources that have actual mercury emissions in excess of their allocation will need to reduce actual emission rates or purchase additional allowances. Emission sources that have surplus allowances may bank the allowances for use in any future control period or sell the surplus allowances. Revised SIPs that address the CAMR requirements were required to be submitted to EPA by November 17, 2006.

Florida has adopted NSPS Subpart HHHH by reference in Section 62-204.800, F.A.C., subject to the provisions set forth at Section 62-296.480, F.A.C. This latter rule provides Florida's implementation of the Federal CAMR. Florida's proposed SIP revisions implementing CAMR were submitted to EPA Region 4 on December 29, 2006.

The CAMR only applies to coal-fired units and therefore is not applicable to the BPS SCCTs. In addition, on February 8, 2008, the U.S. Court of Appeals for the District of Columbia vacated both EPA's action delisting electric utility steam generators from the CAA Section 112(c) HAP source category list and the CAMR. Essentially, the Court ruled that EPA did not have the authority to delist electric utility steam generators from the HAP source category list and therefore could not adopt a mercury *cap-and-trade* program for electric utilities. EPA now has 2 years to develop NESHAPS for existing power plants.

4.6 FLORIDA EMISSION STANDARDS

FDEP emission standards for stationary sources are contained in Chapter 62-296, Stationary Sources—Emission Standards, F.A.C. General pollutant emission limit standards are included in Section 62-296.320, F.A.C. Sections 62-296.401 through 62-296.418, F.A.C., specify emission standards for 18 categories of sources. Sections 62-296.470 and 62-296.480 address CAIR and CAMR requirements, respectively. Sections 62-296.500 through 62-296.570, F.A.C., establish reasonably available control technology (RACT) requirements for VOC and NO_x emitting facilities. RACT requirements for lead and PM are found in Sections 62-296.600 through 62-296.605 and 62-296.700 through 62-296.712, F.A.C., respectively. Florida has adopted the federal NSPS and NESHAPs by reference in Section 62-204.800, F.A.C.

With respect to the BPS SCCT project, the general Rule 62-296.320(4)(b), F.A.C., visible emission limitation of 20-percent opacity will apply to all point (i.e., stack) emission sources. None of the emission standards specified in Sections 62-296.401 through 62-296.418, F.A.C., are applicable to the BPS SCCTs or emergency generator diesel engines. The VOC, NO_x, lead, and PM RACT requirements do not apply to emission units that are subject to NSR permitting, and therefore are not applicable to the BPS SCCT project. NSPS Subparts KKKK and IIII will be applicable to the BPS SCCTs and emergency generator diesel engines, respectively. There are no 40 CFR Part 61 or Part 63 NESHAPS applicable to the BPS SCCT project.

The BPS SCCT project will comply with all of the applicable Florida emission standards noted above.

APPENDIX A

APPLICATION FOR AIR PERMIT—LONG FORM

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:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- 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, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Tampa Electric Company**	
2. Site Name: **H.L. Culbreath Bayside Power Station**	
3. Facility Identification Number: **0570040**	
4. Facility Location Street Address or Other Locator: **3602 Port Sutton Road** City: **Tampa** County: **Hillsborough** Zip Code: **33619**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **David M. Lukcic, Manager Environmental Projects** **Environmental, Health, and Safety**
2. Application Contact Mailing Address... Organization/Firm: **Tampa Electric Company** Street Address: **P.O. Box 111** City: **Tampa** State: **Florida** Zip Code: **33601-0111**
3. Application Contact Telephone Numbers... Telephone: **(813) 228 – 1095** ext. Fax: **(813) 228 – 1308**
4. Application Contact Email Address: **dmlukcic@tecoenergy.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being 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

PSD air construction permit application for four (4) Pratt & Whitney Power Systems (PWPS) FT8-3® SWIFTPAC® aeroderivative simple-cycle combustion turbine (SCCT) units. Each PWPS FT8-3® SWIFTPAC® unit is comprised of two SCCTs coupled to one common generator having a nominal gross generation capacity of 62 MW. The BPS PWPS FT8-3® SWIFTPAC® SCCTs will be fired exclusively with pipeline-quality natural gas and will operate in peaking service for no more than 3,500 hours per year (hr/yr) per SCCT. The PWPS FT8-3® SWIFTPAC® SCCTs will be located at the existing Bayside Power Station (BPS) in Hillsborough County. A detailed description of the BPS SCCT Project is provided in Section 2.0.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
028	CT3A; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 3	AC1A	
029	CT3B; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 3	AC1A	
030	CT4A; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 4	AC1A	
031	CT4B; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 4	AC1A	
032	CT5A; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 5	AC1A	
033	CT5B; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 5	AC1A	
034	CT6A; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 6	AC1A	
035	CT6B; PWPS Swift Pac Simple-Cycle Combustion Turbine Unit 6	AC1A	
036	Emergency Generator Diesel Engine No. 1	AC1A	
037	Emergency Generator Diesel Engine No. 2	AC1A	

Application Processing Fee

Check one: ☐ Attached - Amount: $____________ ☒ Not Applicable

Application processing fee of $7,500 previously submitted with March 2008 application.

APPLICATION INFORMATION

Owner/Authorized Representative Statement

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

1.	Owner/Authorized Representative Name: **David M. Lukcic, Manager of Environmental Programs** **Environmental, Health, and Safety**
2.	Owner/Authorized Representative Mailing Address Organization/Firm: **Tampa Electric Company** Street Address: **P.O. Box 111** City: **Tampa** State: **Florida** Zip Code: **33601-0111**
3.	Owner/Authorized Representative Telephone Numbers Telephone: **(813) 228 – 1095** ext. Fax: **(813) 228 – 1308**
4.	Owner/Authorized Representative Email Address: **dmlukcic@tecoenergy.com**
5.	Owner/Authorized Representative Statement: *I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.* Signature Date

APPLICATION INFORMATION

Application Responsible Official Certification NOT APPLICABLE

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation 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, CAIR source, or Hg Budget 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 E-mail Address:

6. Application Responsible Official Certification:

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

   Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1.	Professional Engineer Name: **Thomas W. Davis** Registration Number: **36777**
2.	Professional Engineer Mailing Address... Organization/Firm: **Environmental Consulting & Technology, Inc.** Street Address: **3701 Northwest 98th Street** City: **Gainesville** State: **Florida** Zip Code: **32606-5004**
3.	Professional Engineer Telephone Numbers... Telephone: **(352) 332 – 0444** ext. Fax: **(352) 332 - 6722**
4.	Professional Engineer Email Address: **tdavis@ectinc.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] Date: 8/7/08

(seal)

*Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone East (km) **360.00** North (km) **3,087.50**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
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 :			

Facility Contact

1. Facility Contact Name: **Ben Willoughby, Environmental Coordinator**
2. Facility Contact Mailing Address... Organization/Firm: **Tampa Electric Company** Street Address: **3602 Port Sutton Road** City: **Tampa** State: **Florida** Zip Code: **33619**
3. Facility Contact Telephone Numbers: Telephone: **(813) 627 –2880** ext. Fax: **(813) 627 –2951**
4. Facility Contact Email Address: **bpwilloughby@tecoenergy.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 E-mail 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 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	

12. Facility Regulatory Classifications Comment:

NSPS for Stationary Gas Turbines, 40 CFR Part 60 Subpart GG, applies to all of the existing BPS combustion turbines.

NSPS for Stationary Combustion Turbines, 40 CFR Part 60 Subpart KKKK, will apply to the PWPS FT8-3® SWIFTPAC® simple-cycle combustion turbines.

NSPS for Stationary Compression Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart IIII, will apply to the emergency generator diesel engines.

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
Particulate Matter – PM/PM_{10}	**A**	**N**
Sulfur Dioxide – SO_2	**A**	**N**
Nitrogen Oxide - NO_x	**A**	**N**
Carbon Monoxide – CO	**A**	**N**
Volatile Organic Compounds – VOC	**A**	**N**
Sulfuric Acid Mist - SAM	**A**	**N**

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps **NOT APPLICABLE**

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID'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: **Section 2.0** ☐ 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: **Section 2.0** ☐ 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: **Section 2.0** ☐ Previously Submitted, Date:_______

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: ☒ Attached, Document ID: **Section 2.0** ☐ Not Applicable (existing permitted facility)
2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☒ Attached, Document ID: **Section 2.0**
3. Rule Applicability Analysis: ☒ Attached, Document ID: **Section 4.0**
4. List of Exempt Emissions Units: ☐ Attached, Document ID: ☒ Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification: ☒ Attached, Document ID: **Section 2.0** ☐ Not Applicable
6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable
7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_________ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications NOT APPLICABLE

1. List of Exempt Emissions Units: ☐ Attached, Document ID:__________ ☐ Not Applicable (no exempt units at facility)	

Additional Requirements for Title V Air Operation Permit Applications

NOT APPLICABLE

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 Onsite 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

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID: ☒ Previously Submitted, Date: **June 2008**
   ☐ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________
   ☒ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID: ________ ☒ Previously Submitted, Date: **May 2008**
   ☐ Not Applicable (not a CAIR source)

3. Hg Budget Part (DEP Form No. 62-210.900(1)(c)):
   ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________
   ☒ Not Applicable (not a Hg Budget unit)

Additional Requirements Comment

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:
   Aeroderivative simple cycle combustion turbine (SCCT) component of a PWPS FT8-3® SWIFTPAC® unit.

3. Emissions Unit Identification Number: **028 (Unit 3 - CT3A)**

4. Emissions Unit Status Code: **C**	5. Commence Construction Date: **N/A**	6. Initial Startup Date: **N/A**	7. Emissions Unit Major Group SIC Code: **49**

8. Federal Program Applicability: (Check all that apply)

   ☒ Acid Rain Unit

   ☒ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Pratt & Whitney Power Systems** Model Number: **FT8-3® SWIFTPAC®**

10. Generator Nameplate Rating: **62** MW **(nominal)**

11. Emissions Unit Comment:

    Unit 3 PWPS FT8-3® SWIFTPAC® is comprised of two identical simple cycle aeroderivative combustion turbines (CT-3A and CT-3B) and one common electrical generator. The two simple cycle CTs may operate independently.

Emissions Unit Control Equipment/Method: Control **1** of **2**

1. Control Equipment/Method Description: **Water Injection – NOx Pollution Prevention**	
2. Control Device or Method Code: **028**	

Emissions Unit Control Equipment/Method: Control **2** of **2**

1. Control Equipment/Method Description: **Oxidation Catalyst – CO Control**	
2. Control Device or Method Code: **109**	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:	
2. Control Device or Method Code:	

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: **342.7** million Btu/hr **(HHV)**	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: hours/day days/week weeks/year **3,500** hours/year	
6. Operating Capacity/Schedule Comment: **Maximum heat input rate is at 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Heat input will vary with CT load and ambient conditions.**	

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: **3A**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **N/A**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **N/A**		
5. Discharge Type Code: **V**	6. Stack Height: **60** feet	7. Exit Diameter: **9.5** feet
8. Exit Temperature: **893**°F	9. Actual Volumetric Flow Rate: **430,737** acfm	10. Water Vapor: **N/A** %
11. Maximum Dry Standard Flow Rate: **N/A** dscfm		12. Nonstack Emission Point Height: **N/A** 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: **Exit temperature and actual volumetric flow rate data are at 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Temperature and exhaust flow rate will vary with load and ambient conditions.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Pipeline quality natural gas burned in CT3A.**		
2. Source Classification Code (SCC): **2-01-002-02**	3. SCC Units: **Million cubic feet burned**	
4. Maximum Hourly Rate: **0.332**	5. Maximum Annual Rate: **1,162**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,034 (HHV)**
10. Segment Comment: **Maximum hourly and annual rates based on 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Maximum annual rate based on 3,500 hrs/yr/CT.**		

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
NOx	**028**		**EL**
CO	**109**		**EL**
PM/PM10			**EL**
SO2			**EL**
VOC			**EL**

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control: **88**
3. Potential Emissions: **(Per CT)** **32.0** lb/hour **56.0** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** To tons/year	
6. Emission Factor: **N/A** Reference: **Vendor (PWPS) data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential emission rates based on 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT.

Potential annual emission rate based on 3,500 hrs/yr/CT.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1** **(Per CT)**

1. Basis for Allowable Emissions Code: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **25 ppmvd @ 15% O_2**	4. Equivalent Allowable Emissions: **32.0** lb/hour **56.0** tons/year
5. Method of Compliance: **EPA Reference Method 7E**	
6. Allowable Emissions Comment (Description of Operating Method): **Also subject to NSPS Subpart KKKK NO_x emission standard.** **Allowable and equivalent allowable emissions are at 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Equivalent allowable annual emission rate based on 3,500 hrs/yr/CT.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control: **90**
3. Potential Emissions: **(Per CT)** **9.1** lb/hour **8.2** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** To tons/year	
6. Emission Factor: **N/A** Reference: **Vendor (PWPS) data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential hourly emission rate based on 50% load and 20°F ambient temperature.

Potential annual emission rates based on 100% load with evaporative cooling, 59°F ambient temperature, 52°F CT compressor inlet temperature, and 3,500 hrs/yr/CT.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1** **(Per CT)**

1. Basis for Allowable Emissions Code: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **21 ppmvd @ 15% O_2**	4. Equivalent Allowable Emissions: **9.1** lb/hour **8.2** tons/year
5. Method of Compliance: **EPA Reference Method 7E**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable and equivalent allowable hourly emissions are at 50% load and 20°F ambient temperature per CT.** **Equivalent allowable annual emission rate based on 100% load with evaporative cooling, 59°F ambient temperature, 52°F CT compressor inlet temperature, and 3,500 hrs/yr/CT.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM/PM_{10}**	2. Total Percent Efficiency of Control: **N/A**
3. Potential Emissions: **(Per CT)** **2.5** lb/hour **4.4** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** To tons/year	
6. Emission Factor: **N/A** Reference: **Vendor (PWPS) data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential emission rates based on 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT.

Potential annual emission rate based on 3,500 hrs/yr/CT.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **10% opacity (surrogate for PM/PM_{10})**	4. Equivalent Allowable Emissions: **2.5** lb/hour **4.4** tons/year
5. Method of Compliance: **EPA Reference Method 9**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable and equivalent allowable emissions are at 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Equivalent allowable annual emission rate based on 3,500 hrs/yr/CT.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO_2**	2. Total Percent Efficiency of Control: **N/A**
3. Potential Emissions: **(Per CT)** **1.9** lb/hour **3.3** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** To tons/year	
6. Emission Factor: **N/A** Reference: **Vendor (PWPS) data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential emission rates based on 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT.

Potential annual emission rate based on 3,500 hrs/yr/CT.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **N/A**
3. Allowable Emissions and Units: **2.0 gr S / 100 scf natural gas**	4. Equivalent Allowable Emissions: **1.9** lb/hour **3.3** tons/year
5. Method of Compliance: **Fuel analysis per 40 CFR Part 75, Appendix D**	
6. Allowable Emissions Comment (Description of Operating Method): **Also subject to NSPS Subpart KKKK SO_2 emission standard.** **Allowable and equivalent allowable emissions are at 100% load with evaporative cooling, 59°F ambient temperature, and 52°F CT compressor inlet temperature per CT. Equivalent allowable annual emission rate based on 3,500 hrs/yr/CT.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control: **50%**
3. Potential Emissions: **(Per CT)** **5.1** lb/hour **2.4** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** To tons/year	
6. Emission Factor: **N/A** Reference: **Vendor (PWPS) data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential hourly emission rate based on 50% load and 20°F ambient temperature.

Potential annual emission rates based on 100% load with evaporative cooling, 59°F ambient temperature, 52°F CT compressor inlet temperature, and 3,500 hrs/yr/CT.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **ESCPSD**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **CO Limit (surrogate for VOC)**	4. Equivalent Allowable Emissions: **5.1** lb/hour **2.4** tons/year
5. Method of Compliance: **N/A**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable and equivalent allowable hourly emissions are at 50% load and 20°F ambient temperature per CT.** **Equivalent allowable annual emission rate based on 100% load with evaporative cooling, 59°F ambient temperature, 52°F CT compressor inlet temperature, and 3,500 hrs/yr/CT.**	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE 10**	2. Basis for Allowable Opacity: ☐ Rule ☒ Other
3. Allowable Opacity: Normal Conditions: **10** % Exceptional Conditions: **N/A** % Maximum Period of Excess Opacity Allowed: **N/A** min/hour	
4. Method of Compliance: **EPA Reference Method 9**	
5. Visible Emissions Comment:	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **VE 20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **N/A** % Maximum Period of Excess Opacity Allowed: **N/A** min/hour	
4. Method of Compliance: **EPA Reference Method 9**	
5. Visible Emissions Comment: **Rule 62-296.320(4)(b), F.A.C.**	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor **1** of **4**

1. Parameter Code: **EM**	2. Pollutant(s): **NO_x**
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: **Required by 40 CFR Part 75 (Acid Rain Program).** **Monitor information will be provided to the Department when available.**	

Continuous Monitoring System: Continuous Monitor **2** of **4**

1. Parameter Code: **EM**	2. Pollutant(s): **SO_2**
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: **Required by 40 CFR Part 75 (Acid Rain Program).** **Monitor information will be provided to the Department when available.**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor **3** of **4**

1. Parameter Code: **EM**	2. Pollutant(s): **CO**
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: **Monitor information will be provided to the Department when available.**	

Continuous Monitoring System: Continuous Monitor **4** of **4**

1. Parameter Code: **CO_2**	2. Pollutant(s): **N/A**
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: **Required by 40 CFR Part 75 (Acid Rain Program).** **Monitor information will be provided to the Department when available.**	

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: **Section 2.0** ☐ 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: **Section 2.0** ☐ 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: **Section 2.0** ☐ Not Applicable
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

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

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: ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: **To be provided** ☐ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

NOT APPLICABLE

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ___________	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: __________ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: __________ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: __________ ☐ Not Applicable	

Additional Requirements Comment

NOTE:

Emission Units 028 and 029 (Unit 3 - CT3A and CT3B), Emission Units 030 and 031 (Unit 4 - CT4A and CT4B), Emission Units 032 and 033 (Unit 5 - CT5A and CT5B), and Emission Units 034 and 035 (Unit 6 - CT6A and CT6B) are identical emission units.

Section III. Emissions Unit Information provided for EU-028 (Unit 3 - CT3A) is also applicable to EU-029 (Unit 3 - CT3B), Emission Units 030 and 031 (Unit 4 - CT4A and CT4B), Emission Units 032 and 033 (Unit 5 - CT5A and CT5B), and Emission Units 034 and 035 (Unit 6 - CT6A and CT6B).

Emissions Unit Information Sections 2 through 8 are identical to Section 1, with the exception of identification numbers.

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, 800-kW Caterpillar internal combustion (IC) reciprocating engine/generator set; or equivalent.

3. Emissions Unit Identification Number: **036**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C	**N/A**	**N/A**	**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

   ☐ Hg Budget Unit

9. Package Unit:
   Manufacturer: **Caterpillar** Model Number: **DSR4B Generator C27 TA Engine**

10. Generator Nameplate Rating: **0.800** MW

11. Emissions Unit Comment:
    Black start engine/generator set provides electricity to SCCT Units 3 - 6 in the event of power interruption from the grid.

    Diesel engine will be fired with ultra low sulfur diesel (ULSD) fuel oil.

Emissions Unit Control Equipment/Method: Control **1** of **1**

1. Control Equipment/Method Description: **Engine Combustion Design – NOx Pollution Prevention**
2. Control Device or Method Code: **024**

Emissions Unit Control Equipment/Method: Control of

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control __ of __

1. Control Equipment/Method Description:
2. Control Device or Method Code:

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: **7.9** million Btu/hr **(HHV)**		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	hours/day weeks/year	days/week **100** hours/year
6. Operating Capacity/Schedule Comment: **Other than emergencies, the black start emergency generator will be operated approximately two hours per week for routine testing and maintenance.**		

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: **Black Start Generator**	2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **N/A**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **N/A**	

5. Discharge Type Code: **V**	6. Stack Height: **15** feet	7. Exit Diameter: **0.67** feet
8. Exit Temperature: **955**°F	9. Actual Volumetric Flow Rate: **6,046** acfm	10. Water Vapor: **N/A** %

11. Maximum Dry Standard Flow Rate: **N/A** dscfm	12. Nonstack Emission Point Height: **N/A** 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): **Ultra Low Sulfur Diesel (ULSD) fuel oil burned in IC reciprocating engine.**		
2. Source Classification Code (SCC): **2-02-001-02**	3. SCC Units: **Thousand gallons burned**	
4. Maximum Hourly Rate: **0.0572**	5. Maximum Annual Rate: **5.72**	6. Estimated Annual Activity Factor: **N/A**
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash: **0.01**	9. Million Btu per SCC Unit: **137 (HHV)**
10. Segment Comment: **Maximum annual rate based on 100 hours per year operation for routine testing and maintenance, and excludes emergency operations.**		

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
NOx			**EL**
CO			**EL**
VOC			**EL**
PM			**EL**

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOx**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **15.5** lb/hour **0.8** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** to tons/year	
6. Emission Factor: **5.26 grams per horsepower hour (g/hp-hr)** Reference: **Vendor data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential annual emission rate based on 100 hours per year operation for routine testing and maintenance, and excludes emergency operations.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **RULE**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **6.4 g/kWh (4.8 g/hp-hr)**	4. Equivalent Allowable Emissions: **N/A** lb/hour **N/A** tons/year
5. Method of Compliance: **Engine manufacturer certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable limit is for NO_x + NMHC per 40 CFR §89.112, Table 1.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.7** lb/hour **0.03** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** to tons/year	
6. Emission Factor: **0.23 grams per horsepower hour (g/hp-hr)** Reference: **Vendor data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential annual emission rate based on 100 hours per year operation for routine testing and maintenance, and excludes emergency operations.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **RULE**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **3.5 g/kWh (2.6 g/hp-hr)**	4. Equivalent Allowable Emissions: **7.7** lb/hour **N/A** tons/year
5. Method of Compliance: **Engine manufacturer certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable limit per 40 CFR §89.112, Table 1.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.1** lb/hour **0.004** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** to tons/year	
6. Emission Factor: **0.03 grams per horsepower hour (g/hp-hr)** Reference: **Vendor data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential annual emission rate based on 100 hours per year operation for routine testing and maintenance, and excludes emergency operations.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **RULE**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **6.4 g/kWh (4.8 g/hp-hr)**	4. Equivalent Allowable Emissions: **N/A** lb/hour **N/A** tons/year
5. Method of Compliance: **Engine manufacturer certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable limit is for NO_x + NMHC per 40 CFR §89.112, Table 1.**	

Allowable Emissions Allowable Emissions __ of __

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

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

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.07** lb/hour **0.004** tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): **N/A** to tons/year	
6. Emission Factor: **0.024 grams per horsepower hour (g/HP-hr)** Reference: **Vendor data**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year **N/A**	8.b. Baseline 24-month Period: **N/A** From: To:
9.a. Projected Actual Emissions (if required): tons/year **N/A**	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years **N/A**

10. Calculation of Emissions:

Potential annual emission rate based on 100 hours per year operation for routine testing and maintenance, and excludes emergency operations.

See Appendix B.

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: **RULE**	2. Future Effective Date of Allowable Emissions: **N/A**
3. Allowable Emissions and Units: **0.20 g/kWh (0.15 g/hp-hr)**	4. Equivalent Allowable Emissions: **0.4** lb/hour **N/A** tons/year
5. Method of Compliance: **Engine manufacturer certification**	
6. Allowable Emissions Comment (Description of Operating Method): **Allowable limit per 40 CFR §89.112, Table 1.**	

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

Visible Emissions Limitation: Visible Emissions Limitation 1 of 2

1. Visible Emissions Subtype: **VE 20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **N/A** % Maximum Period of Excess Opacity Allowed: **N/A** min/hour	
4. Method of Compliance: **EPA Reference Method 9**	
5. Visible Emissions Comment: **Rule 62-296.320(4)(b)**	

Visible Emissions Limitation: Visible Emissions Limitation 2 of 2

1. Visible Emissions Subtype: **Multiple Limits**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **N/A** % Exceptional Conditions: **N/A** % Maximum Period of Excess Opacity Allowed: **N/A** min/hour	
4. Method of Compliance: **40 CFR Part 86, Subpart I**	
5. Visible Emissions Comment: **40 CFR §89.113 opacity limits.**	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor __ of __ NOT APPLICABLE

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: **Section 2.0** ☐ 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: **Section 2.0** ☐ 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: **Section 2.0** ☐ Not Applicable

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

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

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: ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: ☒ Not Applicable	
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

NOT APPLICABLE

1. Identification of Applicable Requirements: ☐ Attached, Document ID: ________	
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: ________ ☐ Not Applicable	
3. Alternative Methods of Operation: ☐ Attached, Document ID: ________ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: ________ ☐ Not Applicable	

Additional Requirements Comment

NOTE:

Emission Unit 036 (Emergency Generator No. 1) and Emission Unit 037 (Emergency Generator No. 2) are identical emission units.

Section III. Emissions Unit Information provided for EU-036 (Emergency Generator No. 1) is also applicable to EU-037 (Emergency Generator No. 2).

Emissions Unit Information Section 9 is identical to Section 10, with the exception of identification numbers.

APPENDIX B

EMISSION RATE CALCULATIONS

Appendix B - TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Emission Rate Calculations - List of Tables

Source: ECT, 2008.

Table B-1. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Annual Emission Rate Summary

Pollutant	Potential Annual Emissions (ton/yr)		
	P&W CTs (8 CTs)	Emergency Diesel Engines	Project Totals
Criteria Pollutants			
NO_x	448.0	1.6	**449.6**
CO	65.4	0.068	**65.4**
VOC	18.9	0.0089	**18.9**
SO_2	26.5	0.0012	**26.5**
PM_{10} (filterable + condensable)	35.0	0.007	**35.0**
Pb	0.0024	Neg.	**0.0024**
Hazardous Air Pollutants			
Formaldhyde[1]	1.7	Neg.	**1.7**
Total HAPs	2.5	Neg.	**2.5**
Other Pollutants			
H_2SO_4 Mist	3.0	Neg.	**3.0**
PM (filterable)[2]	8.8	0.0071	**8.8**
Other Constituents			
CO_2	527,799	130	**527,929**

N/A - not applicable
Neg. - negligible

[1] Maximum individual HAP.
[2] For P&W CTs, all PM is $PM_{2.5}$ or less. PM (filterable) is assumed to be 25% of total PM_{10}.

Sources: ECT, 2008.
PWPS, 2008.
TEC, 2008.

Table B-2. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
CT Operating Scenarios - Pratt & Whitney FT8-3 Swift Pac Units

Case	Ambient Temperature (°F)	CT Compressor Inlet Temperature (°F)	Load (%)	Evaporative Cooling	Natural Gas Firing	Annual Profile (hrs/yr)
1-G	20	20	100		X	
2-G	20	20	75		X	
3-G	20	20	50		X	
4-G	59	52	100	X	X	3,500
5-G	59	52	75	X	X	
6-G	59	52	50	X	X	
7-G	90	79	100	X	X	
8-G	90	79	75	X	X	
9-G	90	79	50	X	X	

Note: Each FT8-3 Swift Pac Unit consists of two combustion turbines and one common generator.

Sources: ECT, 2008.
PWPS, 2008.
TEC, 2008.

Table B-3. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Hourly PM/PM_{10}, SO_2, H_2SO_4 Mist, and Pb Emission Rates (Per CT) - Natural Gas

Temp. (°F)	Case	Load (%)	PM/PM_{10} [1] (lb/hr)	PM/PM_{10} [1] (g/sec)	SO_2 [2] (lb/hr)	SO_2 [2] (g/sec)	H_2SO_4 [3] (lb/hr)	H_2SO_4 [3] (g/sec)	Lead [4] (lb/hr)	Lead [4] (g/sec)
20	1-Gas	100	2.5	0.32	1.87	0.24	0.21	0.027	0.00017	0.000021
	2-Gas	75	2.5	0.32	1.45	0.18	0.17	0.021	0.00013	0.000016
	3-Gas	50	2.5	0.32	1.06	0.13	0.12	0.015	0.00009	0.000012
59	4-Gas	100	2.5	0.32	1.89	0.24	0.22	0.027	0.00017	0.000021
	5-Gas	75	2.5	0.32	1.47	0.19	0.17	0.021	0.00013	0.000016
	6-Gas	50	2.5	0.32	1.08	0.14	0.12	0.016	0.00010	0.000012
90	7-Gas	100	2.5	0.32	1.79	0.23	0.21	0.026	0.00016	0.000020
	8-Gas	75	2.5	0.32	1.41	0.18	0.16	0.020	0.00012	0.000016
	9-Gas	50	2.5	0.32	1.04	0.13	0.12	0.015	0.00009	0.000012
		Maximums	**2.5**	**0.32**	**1.89**	**0.24**	**0.22**	**0.027**	**0.00017**	**0.000021**

[1] Total particulate matter as measured by EPA RM 201 or 201A, and 202.
[2] Based on natural gas sulfur content of 2.0 gr/100 ft^3.
[3] Based on 7.5% conversion of SO_2 to H_2SO_4.
[4] Lead emission factor, EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-2., July 1998.

Sources: ECT, 2008.
PWPS, 2008.

Table B-4. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Hourly NO_x, CO, AND VOC Emission Rates (Per CT) - Natural Gas

Temp. (°F)	Case	Load (%)	NO_x			CO			VOC[1,2]		
			(ppmvd)[3]	(lb/hr)	(g/sec)	(ppmvd)[3]	(lb/hr)	(g/sec)	(ppmvd)[3]	(lb/hr)	(g/sec)
20	1-Gas	100	25	31.6	3.98	8.0	6.2	0.77	3.0	1.3	0.16
	2-Gas	75	25	24.4	3.07	14.1	8.4	1.05	7.8	2.7	0.33
	3-Gas	50	25	18.2	2.29	20.9	9.1	1.15	20.2	5.1	0.64
59	4-Gas	100	25	32.0	4.03	6.0	4.7	0.59	3.0	1.4	0.17
	5-Gas	75	25	24.8	3.12	11.6	7.0	0.89	5.5	1.9	0.24
	6-Gas	50	25	18.2	2.29	14.8	6.6	0.83	8.6	2.2	0.27
90	7-Gas	100	25	30.2	3.81	6.0	4.4	0.56	3.0	1.3	0.16
	8-Gas	75	25	23.7	2.99	9.3	5.4	0.68	3.8	1.3	0.16
	9-Gas	50	25	17.5	2.21	14.3	6.1	0.77	8.0	2.0	0.25
		Maximums	**25**	**32.0**	**4.03**	**20.9**	**9.1**	**1.15**	**20.2**	**5.1**	**0.64**

[1] 50% control for oxidation catalyst.

[2] Expressed as methane.

[3] Corrected to 15% O_2.

Sources: ECT, 2008.
PWPS, 2008.

Table B-5. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Hazardous Air Pollutant Hourly Emission Rates - Natural Gas (Per CT)

Parameter	Units	Value								
Case	N/A	1-G	2-G	3-G	4-G	5-G	6-G	7-G	8-G	9-G
Maximum CT Hourly Fuel Flow:	10^6 Btu/hr (HHV)	338.6	261.9	192.6	342.7	265.7	195.2	323.3	254.5	187.6

Hazardous Air Pollutant	Gas Emission Factor [1-4] ($lb/10^6$ Btu)	Hourly Emissions 1-G (lb/hr)	2-G (lb/hr)	3-G (lb/hr)	4-G (lb/hr)	5-G (lb/hr)	6-G (lb/hr)	7-G (lb/hr)	8-G (lb/hr)	9-G (lb/hr)
1,3-Butadiene	2.15E-07	7.28E-05	5.63E-05	4.14E-05	7.37E-05	5.71E-05	4.20E-05	6.95E-05	5.47E-05	4.03E-05
Acetaldehyde	2.00E-05	6.77E-03	5.24E-03	3.85E-03	6.85E-03	5.31E-03	3.90E-03	6.47E-03	5.09E-03	3.75E-03
Acrolein	3.20E-06	1.08E-03	8.38E-04	6.16E-04	1.10E-03	8.50E-04	6.25E-04	1.03E-03	8.14E-04	6.00E-04
Arsenic (As)	1.96E-07	6.64E-05	5.14E-05	3.78E-05	6.72E-05	5.21E-05	3.83E-05	6.34E-05	4.99E-05	3.68E-05
Benzene	6.00E-06	2.03E-03	1.57E-03	1.16E-03	2.06E-03	1.59E-03	1.17E-03	1.94E-03	1.53E-03	1.13E-03
Beryllium (Be)	1.18E-08	3.98E-06	3.08E-06	2.27E-06	4.03E-06	3.13E-06	2.30E-06	3.80E-06	2.99E-06	2.21E-06
Cadmium (Cd)	1.08E-06	3.65E-04	2.82E-04	2.08E-04	3.70E-04	2.87E-04	2.10E-04	3.49E-04	2.74E-04	2.02E-04
Chromium (Cr)	1.37E-06	4.65E-04	3.59E-04	2.64E-04	4.70E-04	3.65E-04	2.68E-04	4.44E-04	3.49E-04	2.58E-04
Ethylbenzene	1.60E-05	5.42E-03	4.19E-03	3.08E-03	5.48E-03	4.25E-03	3.12E-03	5.17E-03	4.07E-03	3.00E-03
Formaldehyde	3.55E-04	1.20E-01	9.30E-02	6.84E-02	1.22E-01	9.43E-02	6.93E-02	1.15E-01	9.03E-02	6.66E-02
Lead (Pb)	4.90E-07	1.66E-04	1.28E-04	9.44E-05	1.68E-04	1.30E-04	9.57E-05	1.59E-04	1.25E-04	9.20E-05
Manganese (Mn)	3.73E-07	1.26E-04	9.76E-05	7.17E-05	1.28E-04	9.90E-05	7.27E-05	1.20E-04	9.48E-05	6.99E-05
Mercury (Hg)	2.55E-07	8.63E-05	6.68E-05	4.91E-05	8.74E-05	6.77E-05	4.98E-05	8.24E-05	6.49E-05	4.78E-05
Naphthalene	6.50E-07	2.20E-04	1.70E-04	1.25E-04	2.23E-04	1.73E-04	1.27E-04	2.10E-04	1.65E-04	1.22E-04
Nickel (Ni)	2.06E-06	6.97E-04	5.39E-04	3.96E-04	7.06E-04	5.47E-04	4.02E-04	6.66E-04	5.24E-04	3.86E-04
Polycyclic Aromatic Hydrocarbons	1.10E-06	3.72E-04	2.88E-04	2.12E-04	3.77E-04	2.92E-04	2.15E-04	3.56E-04	2.80E-04	2.06E-04
Propylene Oxide	1.45E-05	4.91E-03	3.80E-03	2.79E-03	4.97E-03	3.85E-03	2.83E-03	4.69E-03	3.69E-03	2.72E-03
Selenium (Se)	2.35E-08	7.97E-06	6.16E-06	4.53E-06	8.06E-06	6.25E-06	4.59E-06	7.61E-06	5.99E-06	4.42E-06
Toluene	6.50E-05	2.20E-02	1.70E-02	1.25E-02	2.23E-02	1.73E-02	1.27E-02	2.10E-02	1.65E-02	1.22E-02
Xylene	3.20E-05	1.08E-02	8.38E-03	6.16E-03	1.10E-02	8.50E-03	6.25E-03	1.03E-02	8.14E-03	6.00E-03
Maximum Individual HAP		**0.120**	**0.093**	**0.068**	**0.122**	**0.094**	**0.069**	**0.115**	**0.090**	**0.067**
Total HAPs		**0.176**	**0.136**	**0.100**	**0.178**	**0.138**	**0.101**	**0.168**	**0.132**	**0.097**

[1] - All emission factors except metals, EPA AP-42, Section 3.1 Stationary Gas Turbines, Table 3.1-3., April 2000.
[2] - Organic pollutant emission factors reduced by 50% percent due to use of oxidation catalyst.
[3] - Lead emission factor, EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-2., July 1998.
[4] - Metallic emission factors, EPA AP-42, Section 1.4 Natural Gas Combustion, Table 1.4-4., July 1998.

Sources: ECT, 2008.
PWPS, 2008.

Table B-6. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Hazardous Air Pollutant Annual Emission Rates (8 CTs)

Hazardous Air Pollutant	Annual Emissions Profile (ton/yr)
1,3-Butadiene	1.03E-03
Acetaldehyde	9.60E-02
Acrolein	1.54E-02
Arsenic	9.41E-04
Benzene	2.88E-02
Beryllium	5.64E-05
Cadmium	5.17E-03
Chromium	6.59E-03
Ethylbenzene	7.68E-02
Formaldehyde	1.70E+00
Lead	2.35E-03
Manganese	1.79E-03
Mercury	1.22E-03
Naphthalene	3.12E-03
Nickel	9.88E-03
Polycyclic Aromatic Hydrocarbons	5.28E-03
Propylene Oxide	6.96E-02
Selenium	1.13E-04
Toluene	3.12E-01
Xylene	1.54E-01
Maximum Individual HAP	1.703
Total HAPs	2.493

Sources: ECT, 2008.
PWPS, 2008.

Table B-7. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
Annual Criteria and Sulfuric Acid Mist Pollutant Emission Rates

Source	Case	No. of CTs	Annual Operations (hrs/yr)	Emission Rates NO_x (lb/hr)	Emission Rates NO_x (tpy)	Emission Rates CO (lb/hr)	Emission Rates CO (tpy)	Emission Rates VOC (lb/hr)	Emission Rates VOC (tpy)
Units 3-6	4-Gas	8	3,500	256.0	448.0	37.4	65.4	10.8	18.9
		Totals	**3,500**	**N/A**	**448.0**	**N/A**	**65.4**	**N/A**	**18.9**

Source	Case	No. of CTs	Annual Operations (hrs/yr)	Emission Rates PM/PM_{10} (lb/hr)	Emission Rates PM/PM_{10} (tpy)	Emission Rates SO_2 (lb/hr)	Emission Rates SO_2 (tpy)	Emission Rates H_2SO_4 (lb/hr)	Emission Rates H_2SO_4 (tpy)	Emission Rates Lead (lb/hr)	Emission Rates Lead (tpy)
Units 3-6	4-Gas	8	3,500	20.0	35.0	15.2	26.5	1.7	3.0	0.0013	0.0024
		Totals	**3,500**	**N/A**	**35.0**	**N/A**	**26.5**	**N/A**	**3.0**	**N/A**	**0.0024**

Sources: ECT, 2008.
PWPS, 2008.

Table B-8. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
CT Exhaust Data, Natural Gas (Per CT)

A. Exhaust Molecular Weight (MW)

		Exhaust Gas Composition - Volume %								
		100 % Load			75 % Load			50 % Load		
Component	MW (lb/mole)	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F
	Case	1-Gas	4-Gas	7-Gas	2-Gas	5-Gas	8-Gas	3-Gas	6-Gas	9-Gas
Ar	39.944	0.871	0.858	0.842	0.881	0.868	0.851	0.889	0.877	0.859
N_2	28.013	73.2	72.1	70.8	74.1	73.0	71.5	74.7	73.7	72.2
O_2	31.999	13.5	12.9	12.6	14.6	14.0	13.5	15.4	14.9	14.4
CO_2	44.010	3.14	3.29	3.27	2.72	2.88	2.93	2.38	2.52	2.57
H_2O	18.015	9.25	10.77	12.45	7.76	9.29	11.24	6.57	8.05	10.00
	Totals	100.0	99.9	100.0	100.1	100.0	100.0	99.9	100.0	100.0
Exhaust MW (lb/mole)		28.22	28.06	27.88	28.38	28.22	28.00	28.44	28.32	28.11
Exhaust Flow (lb/sec)		212.0	204.0	192.0	190.0	182.0	169.0	161.0	153.0	143.0
Exhaust Temp. (°F)		828	893	917	748	817	864	701	767	814
(K)		715	751	765	671	709	735	645	681	708
Exhaust O_2 (Vol %, Dry)		14.88	14.46	14.39	15.83	15.43	15.21	16.48	16.20	16.00

B. Exhaust Flow Rates

	Flow Rates (ft^3/min)								
	100 % Load			75 % Load			50 % Load		
	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F
Case	1-Gas	4-Gas	7-Gas	2-Gas	5-Gas	8-Gas	3-Gas	6-Gas	9-Gas
ACFM	423,625	430,737	415,146	354,140	360,629	349,844	287,770	290,208	283,774
Stack Dia. (ft)	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Velocity (fps)	99.6	101.3	97.6	83.3	84.8	82.3	67.7	68.2	66.7
Velocity (m/s)	30.4	30.9	29.8	25.4	25.8	25.1	20.6	20.8	20.3
SCFM, Dry[1]	157,597	149,989	139,366	142,778	135,257	123,833	122,274	114,829	105,847
SCFM[1] (15% O_2, Dry)	160,908	163,793	153,733	122,734	125,312	119,435	91,541	91,387	87,907

[1] At 68 °F.

Sources: ECT, 2008.
PWPS, 2008.

Table B-9. TEC Bayside Generating Station
Simple Cycle Combustion Turbines; Units 3 - 6
CT Fuel Flow Rate Data (Per CT) - Natural Gas[1]

	100 % Load			75 % Load			50 % Load		
	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F	20 °F	59 °F	90 °F
Case	1-Gas	4-Gas	7-Gas	2-Gas	5-Gas	8-Gas	3-Gas	6-Gas	9-Gas
Heat Input - LHV (MMBtu/hr)	305.2	308.9	291.4	236.1	239.5	229.4	173.6	175.9	169.1
Heat Input - HHV (MMBtu/hr)	338.6	342.7	323.3	261.9	265.7	254.5	192.6	195.2	187.6
Fuel Rate (lb/hr)	14,763	14,945	14,099	11,420	11,585	11,097	8,396	8,511	8,182
Fuel Rate (10^6 ft^3/hr)	0.328	0.332	0.313	0.253	0.257	0.246	0.186	0.189	0.182
Fuel Rate (lb/sec)	4.101	4.151	3.916	3.172	3.218	3.082	2.332	2.364	2.273

[1] Includes 7.0 percent margin.

Sources: ECT, 2008.
PWPS, 2008.

Table B-10. TEC Bayside Power Station
Emergency Diesel Engines
Criteria Pollutant Emission Rates

Parameter	Units	Emergency Generator Engines (Per Engine)
Vendor	-	Caterpillar
Model	-	C27 TA
Output	hp	1,340
	kWe	800
Hours	hr/yr	100
Max. ULSD Fuel Flow	gal/hr	57.2
ULSD Fuel S Content	wt % S	0.0015
ULSD Fuel Density	lb/gal	7.08
Criteria Pollutant		
NO_x	g/hp-hr	5.26
	lb/hr	15.5
	ton/yr	0.78
CO	g/hp-hr	0.23
	lb/hr	0.68
	ton/yr	0.034
VOC	g/hp-hr	0.03
	lb/hr	0.1
	ton/yr	0.004
$PM/PM_{10}/PM_{2.5}$	g/hp-hr	0.024
	lb/hr	0.071
	ton/yr	0.004
SO_2	g/hp-hr	0.004
	lb/hr	0.012
	ton/yr	0.0006

Sources: Caterpillar, 2007.
ECT, 2008

Table B-11. TEC Bayside Power Station
Emergency Diesel Engines
Hazardous Air Pollutant Emission Rates

Parameter	Units	Emergency Generator Engines (Per Engine)
Vendor	-	Caterpillar
Model	-	C27 TA
Output	hp	1340
		800
Hours	hr/yr	100
Max. ULSD Fuel Flow	gal/hr	57.2
ULSD Fuel Heat Content	Btu/gal (HHV)	138,000
ULSD Fuel Density	lb/gal	7.08
Engine Heat Input	MMBtu/hr (HHV)	7.89
Hazardous Air Pollutant		
1,3-Butadiene	lb/MMBtu	3.91E-05
	lb/hr	3.09E-04
	ton/yr	1.54E-05
Acetaldehyde	lb/MMBtu	7.67E-04
	lb/hr	6.05E-03
	ton/yr	3.03E-04
Acrolein	lb/MMBtu	9.25E-05
	lb/hr	7.30E-04
	ton/yr	3.65E-05
Benzene	lb/MMBtu	9.33E-04
	lb/hr	7.36E-03
	ton/yr	3.68E-04
Formaldehyde	lb/MMBtu	1.18E-03
	lb/hr	9.31E-03
	ton/yr	4.66E-04
Polycyclic Aromatic Hydrocarbons (PAH)	lb/MMBtu	1.68E-04
	lb/hr	1.33E-03
	ton/yr	6.63E-05
Toluene	lb/MMBtu	4.09E-04
	lb/hr	3.23E-03
	ton/yr	1.61E-04
Xylene	lb/MMBtu	2.85E-04
	lb/hr	2.25E-03
	ton/yr	1.12E-04

Sources: Caterpillar, 2007.
ECT, 2008

Table B-12. TEC Bayside Power Station
Simple Cycle Combustion Turbines; Units 3 - 6
CT Stack Parameters - Natural Gas

Height Above Grade	60	ft
	18.29	m
Exit Diameter	9.5	ft
	2.90	m

Parameter	Operating Case	1-G	2-G	3-G	4-G	5-G
	Load (%)	100	75	50	100	75
	Ambient Temp. (°F)	20	20	20	59	59
	CT Inlet Temp. (°F)	20	20	20	52	52
Flow Rate	acfm	423,625	354,140	287,770	430,737	360,629
Exit Velocity	ft/sec	99.61	83.27	67.66	101.28	84.80
	m/sec	30.36	25.38	20.62	30.87	25.85
Exit Temperature	°F	828.00	748.00	701.00	893.00	817.00
	K	715.37	670.93	644.82	751.48	709.26

Table B-13. TEC Bayside Power Station Emergency Diesel Engines Stack Parameters

Parameter	Units	Generator Diesel Engine (Per Engine)
Height Above Grade	ft m	15.0 4.57
Exit Diameter	ft m	0.67 0.20
Stack Area	ft^2	0.35
Flow Rate	acfm	6,046
Exit Velocity	ft/sec m/sec	288.7 88.0
Exit Temperature	°F K	955.0 785.9

Sources: Caterpillar, 2007.
ECT, 2008

APPENDIX C

PSD APPLICABILITY ANALYSIS

APPENDIX C

TAMPA ELECTRIC COMPANY
BAYSIDE POWER STATION SIMPLE CYCLE UNITS 3 -6
PSD APPLICABILITY ANALYSIS

An analysis of PSD applicability for the Bayside Power Station (BPS) Simple-Cycle Combustion Turbines (SCCT) Project was conducted for nitrogen oxides (NO_x) and particulate matter (PM/PM_{10}) in accordance with Paragraph 86.1 of the TEC/U.S. Environmental Protection Agency (EPA) Consent Decree. Prevention of Significant Deterioration (PSD) applicability for the remaining PSD pollutants (carbon monoxide [CO], sulfur dioxide [SO_2], volatile organic compounds [VOCs], lead [Pb], and sulfuric acid mist [H_2SO_4]) was conducted in accordance with Rule 62-212.400(2), Florida Administrative Code (F.A.C.). A discussion of PSD applicability for each set of PSD pollutants is provided in the following sections.

A. NO_x and PM/PM_{10}

Under Paragraph 86.1 of the TEC/EPA Consent Decree, a portion of the actual emission reductions that occurred by the repowering of Gannon Unit 6 with Unit 2 are creditable with respect to the PSD permitting program. Under the TEC/EPA Consent Decree, TEC had the choice of either: (a) continuing to combust coal in Gannon Unit 6 and install an SCR control system achieving a NO_x emission rate of 0.10 pounds per million British thermal units (lb/MMBtu), or (b) repowering Gannon Unit 6 and meeting a NO_x emission limit of 3.5 parts per million (ppm). TEC chose the latter option and repowered Gannon Unit 6 with BPS Unit 2. Choosing to repower Gannon Unit 6 instead of continuing to combust coal and installing SCR controls resulted in significantly lower actual NO_x emissions. The difference in NO_x emissions (i.e., Gannon Unit 6 with SCR achieving 0.10 lb/MBtu and repowering Unit 6 with BPS Unit 2 achieving 3.5 ppmvd) represents the amount of creditable NO_x emission reduction available for the PSD netting analysis in accordance with Paragraph 86.1 of the TEC/EPA Consent Decree and results in a net NO_x emission decrease of 492.4 tons per year (tpy). Similarly, the difference in PM/PM_{10} emissions (i.e., Gannon Unit 6 with SCR achieving 0.010 lb/MMBtu and repowering

Unit 6 with BPS Unit 2 achieving 20.3 pounds per hour (lb/hr) per combustion turbine (CT) based on natural gas-firing) represents the amount of creditable PM/PM_{10} emission reduction available for the PSD netting analysis in accordance with Paragraph 86.1 of the EPA/TEC Consent Decree and results in a net PM/PM_{10} emission increase of 2.3 tpy.

Using the pre-repowering netting methodology requested by the Department, the creditable emissions resulting from the repowering of Gannon Unit 6 with BPS Unit 2 was calculated by subtracting Gannon Unit 6 baseline emissions from BPS Unit 2 emissions using Gannon Unit 6 actual annual average heat input and power generation for the 24-month February 2001 through January 2003 baseline period. BPS Unit 2 is comprised of four (4) GE 7FA natural gas-fired combined cycle combustion turbines. Gannon Unit 6 baseline emissions were calculated by multiplying the TEC/EPA Consent Decree Paragraph 86.1 NO_x and PM/PM_{10} emission limits of 0.10 and 0.010 lb/MMBtu, respectively, by the February 2001 through January 2003 Gannon Unit 6 annual average heat input of 20,418,548 million British thermal units per year (MMBtu/yr). BPS Unit 2 emissions were calculated by multiplying the 100 percent load, 59 degrees Fahrenheit (°F) NO_x and PM/PM_{10} emission rates of 0.0848 and 0.0745 lb/MW-hr, respectively, by the February 2001 through January 2003 Gannon Unit 6 annual average power generation of 1,862,796 megawatt hours per year (MW-hr/yr). The BPS Unit 2 NO_x and PM/PM_{10} emission rates in units of megawatt-hour (MW-hr) were calculated by dividing the 100-percent load, 59°F NO_x and PM/PM_{10} mass emission rates of 23.1 and 20.3 lb/hr/CT by one-fourth of the total BPS Unit 2 power generation rate of 1,090 megawatts (MW). Subtracting Gannon Unit 6 baseline emissions from the BPS Unit 2 emissions results in creditable Gannon Unit 6 repowering NO_x and PM/PM_{10} emission reductions of 942.0 and 32.7 tpy, respectively.

APPENDIX C

TAMPA ELECTRIC COMPANY
BAYSIDE POWER STATION SIMPLE CYCLE UNITS 3 -6
PSD APPLICABILITY ANALYSIS

Each of the BPS four proposed Pratt & Whitney Power Systems (PWPS) FT8-3® SWIFTPAC® peaking units is comprised of two SCCTs for a total of eight SCCTs. The procedure for calculating the creditable emission increase for the new PWPS SCCTs is Rule 62-212.400(2)2., F.A.C.—Baseline Actual-to-Potential Applicability Test for Construction of New Emission Units. Since baseline actual emissions for the PWPS SCCTs are zero, the creditable emission increase for the PWPS SCCTs is the SCCT's potential emissions as defined by Rule 62-210.200(244), F.A.C. From Appendix B, Table B-1, potential NO_x and PM/PM_{10} annual emission rates are 449.6 and 35.0 tpy, respectively.

Subtracting the creditable Gannon Unit 6 repowering NO_x and PM/PM_{10} emission reductions from the BPS SCCT Project potential NO_x and PM/PM_{10} emissions results in a net decrease of 492.4 tpy for NO_x, and a net increase of 2.3 tpy for PM/PM_{10}. Since these changes in NO_x and PM/PM_{10} emissions are below the PSD significant emission rate thresholds of 40 tpy (for NO_x), 25 tpy (for PM), and 15 tpy (for PM_{10}), the BPS SCCT Project is not subject to PSD review for NO_x and PM/PM_{10}. Table C-1 provides a summary of the historical Gannon Unit 6 heat input and generation data obtained from the EPA Clean Air Markets website for the February 2001 through January 2003 baseline period. A summary of the BPS SCCT Project PSD applicability analysis for NO_x and PM/PM_{10} is provided on Table C-2.

B. CO, SO_2, VOC, Pb, and H_2SO_4 Mist

Para graph 86.1 of the TEC/EPA Consent Decree only addresses PSD netting for NO_x, SO_2, and PM. For the remaining PSD pollutants (CO, SO_2, VOC, Pb, and H_2SO_4 mist), PSD applicability was conservatively analyzed by comparing BPS SCCT Project potential annual emissions to the PSD significant emission rate thresholds without consideration of any creditable emission reductions associated with the repowering of Gannon Unit 6.

BPS SCCT Project potential emission rates are provided in Appendix B, Table B-1. Since BPS SCCT Project potential emissions for CO, SO_2, VOC, Pb, and H_2SO_4 mist are each below the PSD significant emission rate thresholds of 100 tpy (for CO), 40 tpy (for SO_2 and VOC), 0.6 tpy (for Pb), and 7 tpy (for H_2SO_4 mist), the BPS SCCT Project is not subject to PSD review for these pollutants.

In summary, BPS SCCT Project is not subject to PSD review for any pollutant. A summary of PSD applicability for all PSD pollutants is provided in Table C-3.

Table C-1. Bayside Peaker Project
PSD Netting Analysis - Gannon Unit 6 Historical Load and Heat Input Data

Facility	ORIS Code	Unit ID	Year	Month	Program	Load (MW-hr)	Heat Input (MMBtu)
Gannon"	646	GB06	2001	2	ARP	194,952	2,124,478
Gannon"	646	GB06	2001	3	ARP	226,946	2,439,844
Gannon"	646	GB06	2001	4	ARP	6,035	73,618
Gannon"	646	GB06	2001	5	ARP	232,539	2,545,928
Gannon"	646	GB06	2001	6	ARP	177,801	2,002,438
Gannon"	646	GB06	2001	7	ARP	198,286	2,247,297
Gannon"	646	GB06	2001	8	ARP	195,381	2,213,661
Gannon"	646	GB06	2001	9	ARP	125,311	1,423,558
Gannon"	646	GB06	2001	10	ARP	186,358	1,970,569
Gannon"	646	GB06	2001	11	ARP	191,636	1,968,143
Gannon"	646	GB06	2001	12	ARP	169,880	1,770,178
Gannon"	646	GB06	2002	1	ARP	158,538	1,628,898
Gannon"	646	GB06	2002	2	ARP	174,655	1,870,572
Gannon"	646	GB06	2002	3	ARP	158,549	1,731,726
Gannon"	646	GB06	2002	4	ARP	171,006	1,937,898
Gannon"	646	GB06	2002	5	ARP	195,261	2,156,689
Gannon"	646	GB06	2002	6	ARP	176,660	2,009,223
Gannon"	646	GB06	2002	7	ARP	159,917	1,768,850
Gannon"	646	GB06	2002	8	ARP	184,726	1,967,794
Gannon"	646	GB06	2002	9	ARP	183,460	1,936,028
Gannon"	646	GB06	2002	10	ARP	40,434	422,323
Gannon"	646	GB06	2002	11	ARP	0	0
Gannon"	646	GB06	2002	12	ARP	59,966	750,608
Gannon"	646	GB06	2003	1	ARP	157,295	1,876,775
				Annual Average		**1,862,796**	**20,418,548**

Sources: ECT, 2008.
EPA Clean Air Markets Website, 2008.
TEC, 2008.

Table C-2. Bayside Peaker Project
PSD Netting Analysis for NO_x and PM Per TEC/EPA Consent Decree

A. Gannon Unit 6 Baseline Emissions

Item No.	Description	Value	Units	Comments
1	Average Heat Input	20,418,548	MMBtu/yr	Annual average for February 2001 - January 2003.
2	Average Power Generation	1,862,796	MW-hr/yr	Annual average for February 2001 - January 2003.
3	NO_x Emission Rate	0.10	lb/MMBtu	Per Paragraph 86.1 of the TEC/EPA Consent Decree.
4	PM Emission Rate	0.010	lb/MMBtu	Per Paragraph 86.1 of the TEC/EPA Consent Decree.
5	NO_x Emissions	1,020.9	ton/yr	Item 3 x Item 1
6	PM Emissions	102.1	ton/yr	Item 4 x Item 1
B. Bayside Unit 2 Emissions				
7	NO_x Emission Rate	0.0848	lb/MW-hr	Equivalent to 3.5 ppmvd @ 15% O_2 and 23.1 lb/hr/CT.
8	PM Emission Rate	0.0745	lb/MW-hr	Equivalent to 20.3 lb/hr/CT.
9	NO_x Emissions	79.0	ton/yr	Item 7 x Item 2
10	PM Emissions	69.4	ton/yr	Item 8 x Item 2
C. Creditable Gannon Unit 6/Bayside Unit 2 Repowering Emissions				
11	Creditable NO_x Emissions	-942.0	ton/yr	Item 9 - Item 5
12	Creditable PM Emissions	-32.7	ton/yr	Item 10 - Item 6
D. Bayside Peaker Project Potential Emissions				
13	NO_x Emission Increase	449.6	ton/yr	From Appendix B, Table B-1.
14	PM Emission Increase	35.0	ton/yr	From Appendix B, Table B-1.
E. Net Change in Emissions				
15	Change in NO_x Emissions	-492.4	ton/yr	Item 11 + Item 13
16	Change in PM Emissions	2.3	ton/yr	Item 12 + Item 14

Sources: ECT, 2008.
TEC, 2008.

Table C-3. Bayside Peaker Project
PSD Applicability Summary

Pollutant	Net Change in Annual Emissions[1] (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD Review (Y/N)
NO_x	-492.4	40	N
CO	65.4	100	N
PM	2.3	25	N
PM_{10}	2.3	15	N
SO_2	26.5	40	N
Ozone/VOC	18.9	40	N
Lead	0.0024	0.6	N
Mercury	Negligible	0.1	N
Total fluorides	Not present	3	N
H_2SO_4 mist	3.0	7	N
Total reduced sulfur (S) (including hydrogen sulfide [H_2S])	Not present	10	N
Reduced sulfur compounds (including H_2S)	Not present	10	N
Municipal waste combustor acid gases (measured as SO_2 and hydrogen chloride [HCl])	Not present	40	N
Municipal waste combustor metals (measured as PM)	Not present	15	N
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	Not present	3.5×10^6	N
For the pollutants listed above, and for major stationary sources locating within 10 km of a Class I area having an impact equal to or greater than 1 $\mu g/m^3$, 24-hour average	N/A	Any amount	N

[1] Emission rates shown for CO, SO_2, VOC, lead, and H_2SO_4 mist represent potential annual rates for the BPS SCCT project without consideration of netting per the TEC/EPA Consent Decree.

Sources: ECT, 2008
PWPS, 2008.
TEC, 2008.