TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Big Bend Station
Facility ID No. 0570039

PROJECT

Project No. 0570039-071-AC (PSD-FL-040B)
Application for Minor Source Air Construction Permit
Minor Air Construction Permit Revisions

COUNTY

Hillsborough County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blairstone Road, MS#5505
Tallahassee, Florida 32399-2400

December 4, 2014

1. GENERAL PROJECT INFORMATION

1.1. Facility Description and Location

Tampa Electric Company (TEC) Big Bend Station is a nominal 1,892 megawatt (MW) electric generation facility. This facility consists of four fossil fuel fired boiler electrical generating Units 1 – 4 (EU 001 – EU 004); four steam turbines electrical generators; two simple-cycle combustion turbine (SCCT) 4A and 4B (EU 041 and EU 042) sharing a common electrical generator; solid fuels, fly ash, limestone, gypsum, slag, bottom ash storage and handling facilities; and, fuel oil storage tanks.

Units 1 through 4 have a combined electrical generating output of 1,821 MW. Units 1 through 3 each have a design electrical generating capacity of 445 MW. Unit 4 has a design electrical generating capacity of 486 MW. The fuel fired in all four units consists of coal, or a coal/petroleum coke blend containing a maximum of 20% petroleum coke by weight, or coal blended with coal residual generated from the Polk Power Station, or a coal/petroleum coke blend further blended with coal residual generated from the Polk Power Station, and on-site generated fly ash. In addition to the fuels allowed to be burned during normal operation, each unit burns new No. 2 fuel oil during startup, shutdown, flame stabilization, and during the startup of an additional solid fuel mill on an already operating unit.

For each unit, nitrogen oxide (NO_X) emissions are controlled by low-NO_X burners and a selective catalytic reduction system. Unit 4 also has a separated over fire air system to further control NO_X emissions. Particulate matter (PM) emissions are controlled by a dry electrostatic precipitator while sulfur dioxide (SO_2) emissions are controlled by wet flue gas desulfurization system on each unit. Continuous opacity monitoring systems (COMS) are used to measure opacity. Units 1 through 3 are equipped with continuous emissions monitoring systems (CEMS) to measure NO_X, SO_2, and carbon dioxide (CO_2). Unit 4 is equipped with CEMS to measure carbon monoxide (CO), NO_X, SO_2, and CO_2. These units began operation in 1970 (Unit 1), 1973 (Unit 2), 1976 (Unit 3), and 1985 (Unit 4).

The SCCT 4A and 4B (EU 041 and EU 042) consist of one PWPS FT8-3® SwiftPac® aero-derivative SCCT-electrical generator to operate in simple cycle mode. The SwiftPac® consists of two combustion turbines coupled to one common generator having a nominal gross generation capacity of 62 MW. Each SCCT is allowed to fire pipeline-quality natural gas and ultra-low sulfur distillate fuel oil. Each SCCT is equipped with water injection to minimize NO_X emissions and an oxidation catalyst to minimize CO and volatile organic compounds emissions.

Figure 1. Location of TEC Big Bend Station.

Figure 2. TEC Big Bend Station.

The facility is categorized under Standard Industrial Classification Code No. 4911. The existing Big Bend Station is located in Hillsborough County at 13031 Wyandotte Road in Apollo Beach, Florida. The UTM coordinates of the existing facility are Zone 17, 363.15 kilometers (km) East, and 3074.91 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air

Quality Standards (AAQS). **Figure 1** above shows the location of TEC Big Bend Station in Florida while **Figure 2** above shows a view of the Big Bend Station.

1.2. Project Description

This project revises several conditions in underlying air construction permits. TEC applied for concurrent revisions in multiple air construction permits that will be addressed in Permit No. 0570039-071-AC and incorporated in the Title V Air Operation Renewal Permit No. 0570039-072-AV affecting the emissions units (EU) listed in **Table 1** below.

TABLE 1- AFFECTED EMISSIONS UNITS AT THE BIG BEND STATION.

EU No.	Brief Description
001	Fossil Fuel Fired Steam Generator Unit No. 1
002	Fossil Fuel Fired Steam Generator Unit No. 2
003	Fossil Fuel Fired Steam Generator Unit No. 3
004	Fossil Fuel Fired Steam Generator Unit No. 4
037	Coal Residual Storage Facility
038	Coal Residual Transfer System
046	Transloading and Off-site Transfer of Solid Fuels and Slag
047	Railcar Unloading and Conveying System

The purpose of this project is to revise several conditions in underlying air construction permits primarily related to: Units 1 – 3 scrubber removal efficiency; Units 1 – 4 PM and SO_2 emission caps; coal residual storage and transfer system visible emissions testing requirements; revised the solid fuels/slag transloading rate to be based on a daily average instead of a 24-hour average; and, applied New Source Performance Standards (NSPS) Subpart Y (Coal Preparation Plants) to the railroad unloading and conveying operations as noted in the permit. This revision also includes minor changes in the language of Specific Conditions to clarify the intent of the rules and regulations.

1.3. Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility operates units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The facility operates units subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.
- The facility does operate units subject to the NSPS of 40 CFR 60.
- The facility does operate units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

1.4. Processing Schedule

5/15/2014 Received the application for a minor source air pollution construction permit.

5/30/2014 Requested additional information (RAI).

8/26/2014 Request for Extension of RAI.

9/12/2014 Received additional information; application complete.

2. APPLICABLE REGULATIONS

2.1. State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the Florida Administrative Code (F.A.C.). This project is subject to the applicable rules and regulations defined in the following Chapters of the F.A.C.: 62-4 (Permitting Requirements); 62-204 (Ambient Air Quality Requirements, PSD Increments, and Federal Regulations Adopted by Reference); 62-210 (Permits Required, Public Notice, Reports, Stack Height Policy, Circumvention, Excess Emissions, and Forms); 62-212 (Preconstruction Review, PSD Review and Best Available Control Technology (BACT), and Non-attainment Area Review); 62-213 (Title V Air Operation Permits for Major Sources of Air Pollution); 62-296 (Emission Limiting Standards); and 62-297 (Test Methods and Procedures, Continuous Monitoring Specifications, and Alternate Sampling Procedures). PSD applicability and the preconstruction review requirements of Rule 62-212.400, F.A.C. are discussed in Section 2 of this report. Additional details of the other state regulations are provided in Section 3 of this report.

2.2. Federal Regulations

The Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations. Part 60 identifies NSPS for a variety of industrial activities. Part 61 specifies NESHAP based on specific pollutants. Part 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology for given source categories. Federal regulations are adopted in Rule 62-204.800, F.A.C. Additional details of the applicable federal regulations are provided in Section 3 of this report.

2.3. Project Rule Applicability

The project is a revision/clean-up of several old permit conditions. The permit does not authorize any new construction, nor does it relax any previously established operational or emissions limitations. The Department determines that there will not be emissions increase that equals or exceeds a criteria pollutant significant emission rate as defined in Rule 62-210.200 F.A.C. (Definitions); therefore, the project is not subject to PSD preconstruction review pursuant to Rule 62-212.400 F.A.C. Consequently, no air modeling was submitted and a BACT determination was not required.

3. DEPARTMENT REVIEW

The applicant is requesting the following revisions to various emissions units and multiple air construction permits. The proposed revisions to permit language do not affect emissions, production rates or any other significant change. Descriptions of these requests are stated below, followed by the Department's position on the requested changes. This permit is been processed simultaneously with the Title V Air Operation Renewal Permit No. 0570039-072-AV.

3.1. TEC Requested Revisions

Emission sources associated with the following revisions include the Fossil Fuel Fired Steam Generator Units 1 – 3 (EU 001 – EU 003).

Permit No. 0570039-060-AC

1. *Section III, Subsection B, Specific Conditions 6 and 7.*

   Request. As part of the renewal application, TEC requested a more stringent SO_2 emission limit for Units 1 - 3 to streamline the numerous and less stringent SO_2 emission limits in the current Title V permit. TEC indicated that the existing 0.25 pounds per million British thermal units (lb SO_2/MMBtu) limit for Units 1 - 3 is the most stringent SO_2 emissions limit.

   Response. Pursuant to Rule 62-213.440(1), F.A.C., the applicant is requesting to utilize the existing single

allowable SO_2 emissions limit of 0.25 lb/MMBtu of SO_2 on a 30-day rolling average to ensure compliance with each separate multiple applicable SO_2 SIP emission limits established in the Title V permit. The data given in **Table 2** below was provided by the applicant demonstrating that the SO_2 emission limit of 0.25 lb/MMBtu (30-day rolling average) is more stringent than the multiple SO_2 SIP emission limits.

TABLE 2 - EVALUATION OF UNITS 1 - 3 SO_2 STATE IMPLEMENTATION PLAN (SIP) EMISSION LIMITS.

EU No.	SO_2 SIP Limits		Equivalent lb/hour[a] (30-Day Average)			
			Unit 1	Unit 2	Unit 3	Units 1 - 3
001 – 003	6.5 lb/MMBtu	2-hour average	19,089	18,896	19,458	57,443
	31.5 tons/hour	3-hour rolling average	52,898			52,898
	25 tons/hour	24-hour block average	41,983			41,983
	0.25 lb/MMBtu	30-day rolling average	1,009	999	1,029	3,037
001 and 002	16.5 tons/hour	24-hour block average	27,709		---	27,709[b]
003	8.5 tons/hour	24-hour block average	---	---	14,274	1,029[c]

a. The averaging times were converted to a 30-day rolling averages using the EPA guidance Memo. http://www.epa.gov/airquality/sulfurdioxide/pdfs/20140423guidance.pdf
b. EU 001 and EU 002, combined.
c. EU 003 only.

As shown in **TABLE 2**, the 0.25 lb/MMBtu based on a 30-day rolling average is the most stringent SO_2 emission limit. Therefore, the Title V permit established the 0.25 lb/MMBtu (30-day rolling average) as the most stringent SO_2 emission limit, thereby meeting this emission limit will ensure compliance with all of the other SO_2 SIP limits. However, when the SO_2 emission limit was established in Permit No. 0570039-060-AC for Units 1 – 3, the permittee was given an option for the scrubber to remove at least 95% of the SO_2 from the flue gas that entered the scrubber or to meet an SO_2 emission limit of 0.25 lb/MMBtu. The 95% reduction of SO_2 from the scrubber allows these units to exceed the 0.25 lb/MMBtu; therefore, the Department removed the option for the scrubber to reduce 95% of SO_2 from the flue gas.

Emission sources associated with the following revisions include the Fossil Fuel Fired Steam Generator Units 1 – 4 (EU 001 – EU 004).

Permit No. 0570039-012-AC

2. *Section III, Specific Condition 5*

Request. TEC requested to remove the PM and SO_2 emission caps from Units 1 through 4 when combusting raw and beneficiated coal residual since the Polk residual is no longer fired at Big Bend except during emergency situations. In addition, these units are subject to more stringent PM and SO_2 emission limits.

Response. Units 1 - 4 each have PM and SO_2 emission limits that in total equate to 1,785 tons/year of PM emissions and 28,855 tons/year of SO_2 emissions, which is well below the PM and SO_2 emission caps of 2,767 tons/year and 71,810 tons/year, respectively. Raw and beneficiated coal residual is combusted in these units only during emergency situations. Therefore, the Department removed these emission caps.

Emission sources associated with the following revisions include the Fossil Fuel Fired Steam Generator Unit 4 (EU 004).

Permit No. PSD-FL-040

3. *Part I (Specific Conditions), Table 1*

Request. TEC requested to remove Unit 4's lb/hour SO_2 emission limit since it is equivalent to the 0.82 lb/MMBtu emission limit.

Response. The Department removed the SO_2 lb/hour limit since it was intended to represent the equivalent

SO_2 emission limit of 0.82 lb/MMBtu based on the Unit 4's maximum heat input.

Emission sources associated with the following revisions include the Coal Residual Storage Facility (EU 037) and the Coal Residual Transfer System (EU 038).

Permit No. 0570039-012-AC

4. *Section III, Specific Conditions 7, 11 through 14.*

   Request. TEC requested to delete the visible emission testing requirement for these emission units. EU 037 and EU 038 are enclosed with some fugitive emission points. These emissions are only subject to the 20% opacity requirement.

   Response. The Department acknowledges that these emission units are enclosed; therefore, only subject to the 20% opacity standard.

Emission sources associated with the following revision include the Transloading and Off-site Transfer of Solid Fuels and Slag (EU 046).

Permit No. 0570039-059-AC

5. *Section III, Subsection A, Specific Condition A.3.*

   Request. TEC requested to revise the permitted capacity of the solid fuels/slag transloading rate to be based on a daily average and not a 24-hour average.

   Response. The Department revised the condition accordingly.

3.2. Department Revisions

Emission sources associated with the following revisions include the Railcar Unloading and Conveying System (EU 047).

Permit No. 0570039-041-AC

6. *Section III, Specific Conditions 8 and 11*

   The fuel yard was modified under Permit No. 0570039-041-AC, which includes a permitting note stating 40 CFR 60, NSPS Subpart Y for Coal Preparation Plants, have been proposed to be amended on April 28, 2008 and would be applicable to all sources addressed in this standard and constructed after that date. Therefore, the Department revised the visible emissions standard and compliance requirements applicable to the NSPS Subpart Y regulations:

   a. *Visible Emissions Standard*. Visible emissions shall not exceed 10% opacity. This opacity limit excludes equipment used in the loading, unloading, and conveying operations of open storage piles.

   b. *Compliance Requirements*. Coal processing and conveying equipment (e.g., breakers, crushers, screens, conveying systems), coal storage systems, or coal transfer and loading systems that are enclosed in a building, and emissions from the building do not exceed the 10% opacity limit, then the facility shall be deemed to be in compliance with such standards.

4. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Tammy McWade is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer by email at the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blairstone Road, Tallahassee, Florida 32399-2400, by phone at (850) 717-9086 or by email at tammy.mcwade@dep.state.fl.us.