TECHNICAL EVALUATION

APPLICANT

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

Big Bend Station
Facility ID No. 0570039

PROJECT

Project No. 0570039-077-AC
Application for Minor Source Air Construction Permit
Temporary Unloading of New Limestone

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

February 24, 2015

1. GENERAL PROJECT INFORMATION

1.1. Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Chapters 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations in Rule 62-204.800, F.A.C.

1.2. Facility Description and Location

Tampa Electric Company (TEC), Big Bend Station is an electric power facility consisting of four key fossil fuel fired steam generating units (Units 1 – 4). 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** shows the location of TEC, Big Bend Station in Florida while **Figure 2** shows a view of the Big Bend Station.

Figure 1. Location of TEC Big Bend Station.

Figure 2. TEC Big Bend Station.

The Big Bend Station is a nominal 1,892 megawatt (MW) electric generation facility. This facility consists of four fossil fuel fired electrical generating Units 1 – 4; four steam turbines electrical generators (STEG); two simple-cycle combustion turbine (SCCT) 4A and 4B 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 (FGD) system on each unit. Continuous opacity monitoring systems 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 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 (VOC) emissions.

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 operates units subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.
- The facility is a Title V major source of air pollution in accordance with Chapter 62-213, 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 New Source Performance Standards (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. Project Description

TEC is requesting to temporarily unload various types of limestone transported by truck, railcar and/or sea vessel to test in the wet flue gas desulfurization (FGD) systems. The purpose of this project is to explore a higher quality of limestone from other sources to increase the performance of the FGD systems. Currently, the quality of the limestone has been inconsistent and appears to be impacting the performance of the existing FGD systems at the Big Bend Station. Transportation of the limestone will need to be unloaded by trucks, railcars or sea vessels depending on the location of the sources that produce limestone. TEC is currently authorized to receive limestone via truck unloading. Therefore, TEC is requesting to temporarily unload limestone transported by railcar and/or sea vessel while evaluating other sources of limestone.

If it is determined that new limestone will be permanently transported by truck, railcar or sea vessel, TEC will submit an application to obtain an air construction permit. The project is planned to commence in late February 2015.

The following existing emissions units (EU) given in **Table 1** will be affected by this project.

TABLE 1 – AFFECTED EMISSION UNITS.

EU No.	Brief Description
010	Fuel Unloading and Handling Operations

047	Railcar Unloading and Conveying System

1.5. Processing Schedule

02/09/2015 Received the application for a minor source air pollution construction permit.

02/24/2015 Issued exemption package

2. DEPARTMENT REVIEW

Wet FGD systems are primarily used to reduce emission of SO_2 from exhaust flue gasses and to produce a gypsum by-product. The existing FGD systems use limestone to provide alkalinity to scrub gases to remove SO_2. These wet scrubbers can remove up to 95% or more of SO_2 in the flue gas.

2.1. Limestone

Limestone is a sedimentary rock composed largely of the minerals calcite and aragonite, which are different crystal forms of calcium carbonate ($CaCO_3$). Limestone properties affecting the performance of the scrubbers include grind (fine or course ground limestone), composition and reactivity (dolomitic fraction). Limestone reactivity is a determinant of limestone based wet FGD system performance. Problems that can result in low quality limestone used in the FGD systems can consist of: scaling and solids buildup; mist eliminator pluggage; limestone blinding; poor SO_2 removal; poor reagent utilization; and poor gypsum by-product quality.

To address the problems occurring with the existing FGD systems, TEC is requesting to test various types of limestone from other sources in the wet scrubbers. Due to the various locations of the sources that produce limestone, some of the new limestone will need to be delivered to the Big Bend Station by railcars and/or sea vessels.

2.2. Sea Vessel Material Handling Operations

TEC proposes to utilize the existing solids fuel yard handling system to temporarily unload limestone from the vessels and store in the south or north fuel areas. The PECO clam shell will be used to unload each sea vessel at TEC's dock area to existing Conveyor D1 (FH-001). The material will be transferred to the radially stack through existing Conveyors D1, E1 and F1. The existing south stacker/reclaimer system will radially stack the limestone in a designated area in the south or north fuel yards. Heavy equipment such as track hoe loader will load each truck to haul the new limestone to the existing unloading area located on the east side of the facility (FH-027, FH-072, FH-073, FH-064). **Table 2** shows the existing equipment and transfer points that will be used to transfer the limestone from the sea vessels.

TABLE 2 - SEA VESSEL EQUIPMENT AND TRANSFER POINTS.

Solid Fuel Yard Unloading and Handling Operations (EU 010)		
Point ID	**Brief Description**	**Emission Controls**
Barge Unloading Operations		
FH-001	Barge Clamshell to Conveyor D1	Best Management Practices
Coal Conveying Operations		
FH-006	Conveyor D1 to Conveyor E1	Conveyor D1 (open) Conveyor E1 (covered) Transfer Point (Enclosed)
FH-007	Conveyor E1 to Conveyor Y or Conveyor F1	Conveyor F1 (open) Conveyor E1 (covered) Transfer Point (Enclosed)
FH-022	Conveyor F1 to South Stacker Conveyor (G1)	Transfer Point (Enclosed)

Solid Fuel Yard Unloading and Handling Operations (EU 010)		
Point ID	**Brief Description**	**Emission Controls**
FH-023	South Stacker Conveyor (G1) to South/Center Storage Pile	Best Management Practices
Coal Equipment & Storage		
FH-027	South Storage Pile	Best Management Practices
FH-064	Dozer Reclaim from Storage Pile to Loadout or Portable Conveyor	
FH-072	Trucks, Full	
FH-073	Trucks, Empty	

2.3. Railcar Material Handling Operations

TEC also proposes to utilize the existing solids fuel yard and the railcar unloading and conveying system to unload limestone from the railcars. As each railcar passes through the railcar unloading building, the limestone will be dropped through a stationary safety screen and into collecting hoppers. The limestone will be discharged from each collecting hopper through a series of slide gates to control the amount of limestone dropped onto the variable speed belt conveyor. A system of conveyors C10 to C-16 (RC-1 to RC-8) will be used convey limestone from the railcar unloading building to Conveyor F1 in the solid fuel yard (RC-9). Similar to the vessel material handling, the existing south stacker/reclaimer system will radially stack the limestone in a designated area in the south or north fuel yards. Heavy equipment such as track hoe loader will load each truck to haul the limestone to the existing unloading area located on the east side of the facility (FH-027, FH-072, FH-073, FH-064). **Table 3** shows the existing equipment and transfer points that will be used to transfer the new limestone from the railcars.

TABLE 3 - RAILCAR EQUIPMENT AND TRANSFER POINTS.

Solid Fuel Yard Unloading and Handling Operations (EU 010)		
Point ID	**Brief Description**	**Pollutant**
Coal Conveying Operations		
FH-022	Conveyor F1 to South Stacker Conveyor (G1)	Transfer Point (Enclosed)
FH-023	South Stacker Conveyor (G1) to South/Center Storage Pile	Best Management Practices
Coal Equipment & Storage		
FH-027	South Storage Pile	Best Management Practices
FH-064	Dozer Reclaim from Storage Pile to Loadout or Portable Conveyor	
FH-072	Trucks, Full	
FH-073	Trucks, Empty	
Railcar Unloading and Conveying System (EU 047)		
RC-1	Train Car Drop Unloading to Belt Feeder BF-1	Enclosed Building
RC-2	Transfer from BF-1 to Conveyor C-10	Conveyor (covered) Transfer Point (Enclosed)
RC-3	Conveyor C-10 to Conveyor C-11	
RC-4	Conveyor C-11 to Conveyor C-12	
RC-5	Conveyor C-12 to Conveyor C-13	
RC-6	Conveyor C-13 to Conveyor C-14	
RC-7	Conveyor C-14 to Conveyor C-15	
RC-8	Conveyor C-15 to Conveyor C-16 or Conveyor P	
RC-9	Conveyor C-16 Drop to Conveyor F	Conveyor F1 (open) Transfer Point (Enclosed)

2.4. Project Emissions

According to the application, the potential emissions from the project consist of fugitive emissions of PM and PM_{10}. **Table 4** summarizes the annual emissions from these emission units.

TABLE 4 - ANNUAL EMISSIONS SUMMARY FOR THE PROJECT.

Description	Pollutant	Equivalent to	
		lb/hour	TPY
Transfer Points	PM	0.685	3.0
	PM_{10}	0.32	1.4
Storage Pile (wind erosion)	PM	0.02	0.086
	PM_{10}	0.01	0.043
Storage Pile (Dozer Operations	PM	0.03	0.15
	PM_{10}	0.007	0.032
Truck Traffic	PM	0.25	1.1
	PM_{10}	0.055	0.24

1. TPY = tons per year.
2. Emission factors from EPA AP-42, Chapter 13.2.4, Aggregated Handling and Storage Piles, was used to estimate the limestone fugitive emissions.
3. Emission factors from EPA AP-42, Chapter 13.2.1, Paved Roads, was used to estimate fugitive emission from vehicle traffic. A 90% control efficiency was assumed in reducing fugitive emissions from vehicular traffic areas.

The total annual PM/PM_{10} emissions were estimated to be 4.4 tons/year and 1.7 tons/year, respectively. TEC will continue to use the current emissions control methods to control fugitive emission from the project.

2.5. NSPS Provisions

The existing solid fuel yard unloading and handling operations (EU 010) and railcar unloading and conveying system (EU 047) are subject to Subparts A (General Provisions) and Y (Standards of Performance for Coal Preparation and Processing Plants) of 40 CFR 60. These existing emission units meet the applicable requirements of these subparts.

2.6. State Provision

Pursuant to Rule 62.4.040(1)(b), F.A.C., the Department determines that the proposed activities will not emit air pollutants, *"… in sufficient quantity, with respect to its character, quality or content, and the circumstances surrounding its location, use and operation, as to contribute significantly to the pollution problems within the State, so that the regulation thereof is not reasonably justified."* Therefore, the project is exempt from the requirement to obtain an air construction permit provided that the following conditions are met:

- The permittee shall not exceed 105,000 tons of new limestone received by railcar and sea vessel, combined.
- The permittee shall observe and record the total amount of limestone received from each shipment of limestone from the railcars and sea vessels. Following each shipment of limestone by railcar or sea vessel, the permittee shall calculate a rolling total of the amount of limestone received to demonstrate compliance with the maximum permitted amount of limestone delivered by railcar and sea vessel, combined.
- The permittee shall notify the Compliance Authority in writing at least 15 days, or as soon as practical, prior to receiving the initial shipment of limestone by railcar and by sea vessel.

This determination may be revoked if the proposed activities are substantially modified or the basis for the exemption is determined to be materially incorrect. A copy of this letter shall be maintained at the site of the proposed activity. This permitting decision is made pursuant to Chapter 403, Florida Statutes.

3. CONCLUSION

Pursuant to Rule 62.4.040(1)(b) of the Florida Administrative Code (F.A.C.) and for the reasons previously stated, the Office of Permitting and Compliance determines that the activity will not emit air pollutants, "… in sufficient quantity, with respect to its character, quality or content, and the circumstances surrounding its location, use and operation, as to contribute significantly to the pollution problems within the State, so that the regulation thereof is not reasonably justified." Therefore, the project is exempt from the requirement to obtain an air construction

permit. This determination may be revoked if the proposed activity is substantially modified or the basis for the exemption is determined to be materially incorrect. 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 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.