



**TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION**

APPLICANT

Tampa Electric Company (TEC)
13031 Wyandotte Road
Apollo Beach, Florida 33572-9200

Big Bend Station
Facility ID No. 0570039

PROJECT

Project No. 0570039-075-AC
Application for Minor Source Air Construction Permit
Gypsum Pelletizer Project
Minor Construction Permit Project

COUNTY

Hillsborough County, Florida

PERMITTING AUTHORITY

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

January 14, 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. Glossary of Common Terms

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of the permit.

1.3. Facility Description and Location

The Big Bend Station is an existing coal-fired steam electric generation facility, which is categorized under Standard Industrial Classification Code No. 4911. The existing Big Bend Station is located in Hillsborough County at 13031 Wyandotte Road, Apollo Beach, Florida. The UTM coordinates of the existing facility are Zone 17, 363.15 km East, and 3,074.91 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to Ambient Air Quality Standards (AAQS).

1.4. 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 (CAA).
- The facility operates units subject to the Clean Air Interstate Rule (CAIR) provisions of the CAA.
- 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.
- Unit 4 was originally certified pursuant to the power plant siting provisions of Chapter 62-17, F.A.C. (Power Plant Siting Certification PA 79-12).
- The facility is identified as a major source of greenhouse gas (GHG) pollutants.

1.5. Project Description

Gypsum is a by-product created during the Flue-Gas Desulfurization process used to “scrub” SO_x from coal burning emissions. Big Bend Station currently markets its gypsum for the production of wall board as well as agricultural applications. At this time, a much larger percentage of the gypsum sold goes towards wall board production than agriculture. By pelletizing gypsum, Big Bend will see an increased marketability for the synthesized gypsum as fertilizer for agricultural applications, as well as multiple other new possibilities. The pelletizing process will be able to utilize all grades of onsite gypsum production to create a high quality, transportable product. The project will consist of a new building which will house a gypsum dumping area, a gypsum and clay binder mixing area, a pelletizer production line (pellet dryer, cooler and bagging operations), and

storage areas for both bagged and bulk pellets. The project will include several baghouses for collecting gypsum dust from the various activities related to the pelletizing process primarily for recovering sellable product, but also for reducing potential emissions of particulate matter as a secondary benefit.

1.5.1. Process Description:

The Gypsum Pelletizer Process is currently in development by Kercher Industries (manufacturer of Lancaster Products) and will work to mechanically transport raw gypsum through several pieces of equipment to achieve a pellet material composed of gypsum and binder.

1.5.2. Proposed New Construction:

Refer to **Figure 1** and **Figure 2**.

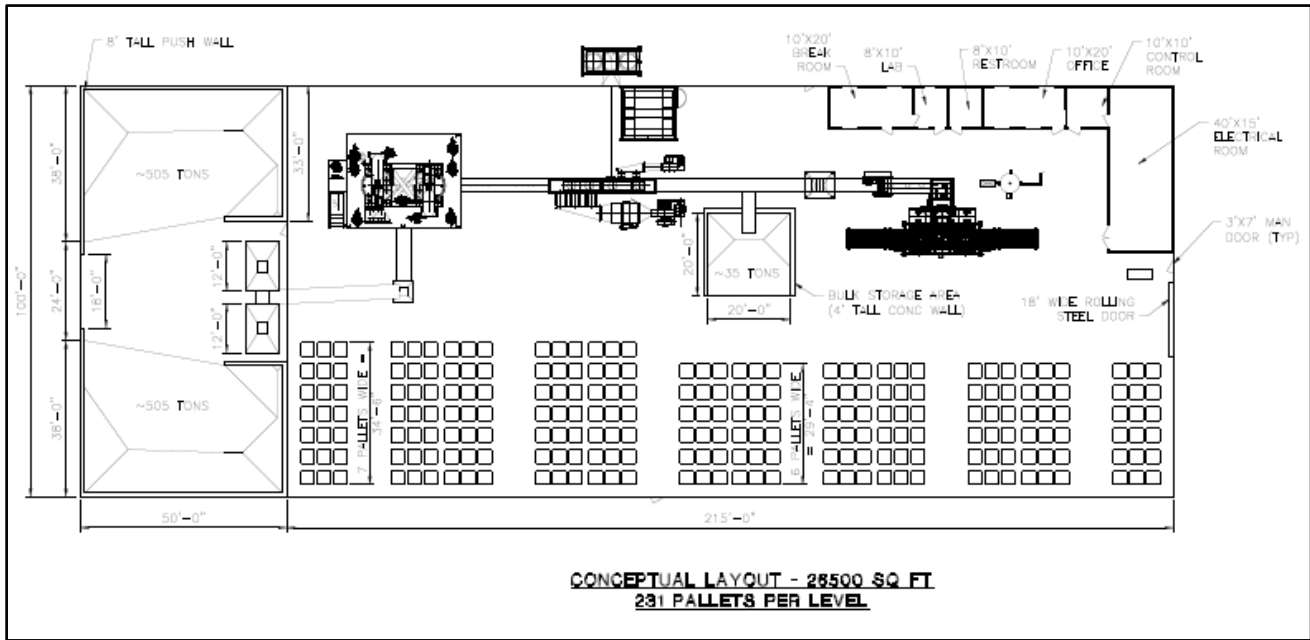


Figure 1. Conceptual Layout.

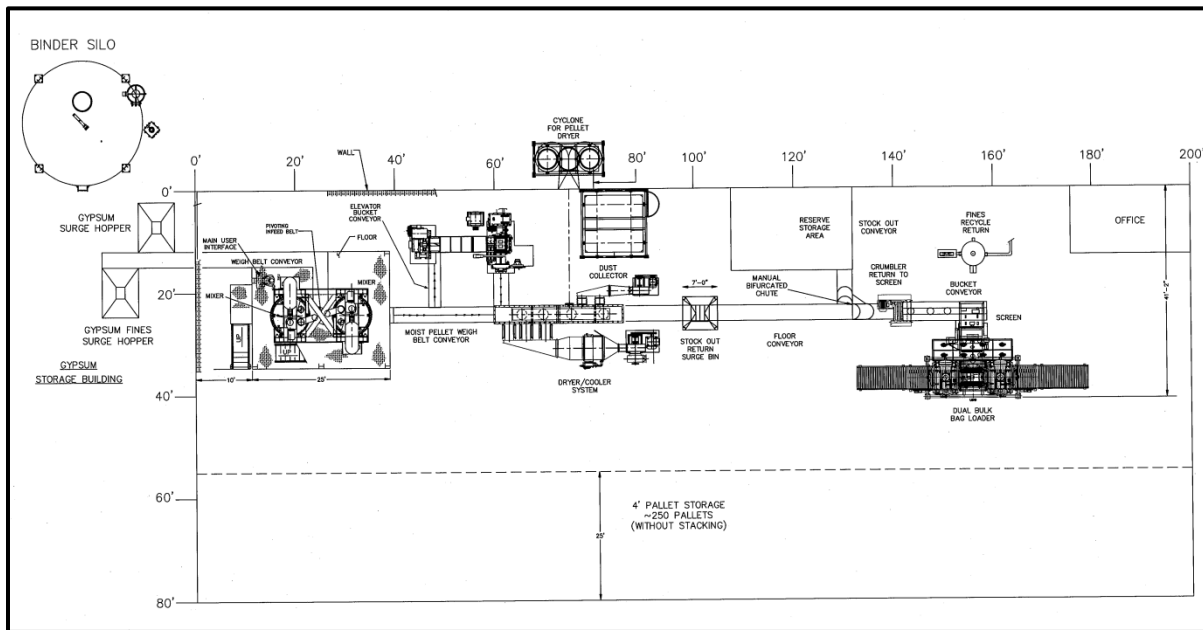


Figure 2. Detail of Proposed New Equipment.

- The Building:

At the time of the application submission, it is assumed a pre-engineered metal building will be the most cost-effective enclosure for this process. The official building type will be chosen by the General Contractor performing this work. The open span pre-engineered metal building will be constructed on a concrete foundation at the new gypsum pelletizer site. The building will consist of a Raw Gypsum Handling Area, a main Operating Area, storage and several framed, climate-controlled occupied spaces. The building may be constructed from galvanized steel members.

The Raw Gypsum Handling Area will be fully enclosable and approximately 30 feet tall to accommodate the backing in and dumping of gypsum by a dump truck. This area will be able to hold approximately 1,000 tons of raw gypsum. An 18' wide by 26' tall metal rolling door will be installed to allow for this portion of the building to be protected from the elements when necessary. It will normally be open. The lower 8' of the walls of this room will be constructed of reinforced concrete push walls to aide in the loading of the gypsum on front-end loaders, the upper section of the wall will be typical pre-engineered metal building. A hopper will be located in the center of the east wall and will be bordered by concrete walls to protect the hopper. Within the area of the walls, there will also be a door to allow access to this area from the main Operating Area.

The Operating Area will house the pelletizer production line as well as storage. This portion of the building will be approximately 65 feet tall. This area will be sized for the inclusion of a future additional production line. If this future option is chosen, storage will be removed from the Operating Area of this building and a new warehouse will be constructed. There will be an 18' wide by 18' high rolling door for access at the east side of the building.

There will be several traditionally framed rooms within the Operating Area of the building. There will be an office space, a break room with kitchen and a unisex bathroom for the employee use. There will also be a laboratory and a control room to support operations. Additionally, an electrical room will be constructed to house electrical PLC equipment. All these spaces will be air conditioned, and the laboratory, break room and rest room will be connected to a potable water source. The laboratory space will be outfitted with a counter and sink, supplied as a part of the building and a deionized water generator and oven to be supplied by the Tampa Electric By-Products Group separate from this project scope. The office, the laboratory and the control room will have internal windows so that the process equipment is visible. The office and break room will have exterior windows.

The building will be equipped with two monorails each capable of a 10 ton carrying capacity running the length of the building and located respectively along each of the production lines (current and future). A gantry crane can be formed using these monorails cooperatively with a beam. This will allow for continued ability to move equipment for installation and maintenance purposes. Removable panels will be designed into the roof system to allow for access with an externally located crane in the case that it is needed.

There will be a storage area located to the south of the building to store approximately 700 reserve pallets. The pallets will be placed on grade.

Ventilation will be factored in to the building design for both the Raw Gypsum Handling Area and the Operating Area. The main spaces will not be climate controlled but rather will be cooled using a fan and louvers. Since the process includes dust suppression and collection systems, dusting is not a concern for the building and will not be considered in the building design.

- Raw Gypsum Handling:

Raw gypsum will be offloaded into the Raw Gypsum Handling Area inside of the new building and will be stacked up against the push walls. A live-bottom feed hopper will be located in this area and will be sized approximately double the size of the front end loader's bucket, 8 cubic yards. It will be surrounded by concrete walls for protection from side impact. The hopper will feed into a conveyor that will weigh the raw gypsum and utilize a diverter to feed one of two mixers positioned on a tower. A magnet will be provided to remove any metal trash that may be mixed in with the gypsum prior to entering the mixer.

- **Gypsum and Clay Binder Mixing:**

The two gypsum and binder mixers are proposed to be Lancaster K-6 mixers capable of mixing a 1.19 ton batch in at most 8 minutes maximum cycle time. A proprietary powdered binder will be supplied in tote bags. The bags will be loaded into a bag unloading assembly via an integrated unloading hoist and trolley system. The bags will be emptied by gravity through a down spout assembly and screw conveying system. The binder will then be conveyed to a mixer and dissolved in water. After mixing, the binder solution will be pumped to a metering and valving station and directly fed into the Lancaster mixers (9A & 9B), as necessary. The system will be located inside the enclosed building and the binder feed system itself will be enclosed to prevent dusting inside the building. There will be a moisture analyzer on the feed conveyor to the mixers and this will provide feedback to a water delivery system, which will add water into the gypsum dependent on the starting moisture content. This equates to approximately 28 gallons, plus or minus, of potable water being used per ton of processed material. The composite bulk density of the material is 53 lb/cu ft. Approximately 68,580 tons will be processed through the mixers annually. This annual throughput is based on two eight-hour shifts per day for an assumed 240 operational days per year.

- **Dryer/Cooler:**

In this phase of the project, there will be one gas fueled, vibrating fluid bed dryer capable of drying and cooling the pelletized gypsum material from 12% moisture to 2% moisture at a rate of 20 tons per hour while maintaining the integrity of the pellets. The material will be cooled to less than 130 degrees F prior to conveying to the bag loading area. It will contain a bag house for dust collection.

- **Stock Out Conveyor:**

A stock out conveyor will allow for bulk load out of dried and pelletized, though un-screened, material into a designated area for bulk material sales or during maintenance of downstream equipment.

- **Recycled Material:**

The process will be equipped with screens downstream of the dryers which will be sized to sort the material based on the client's needs. These screens may be changeable for different clients. Any material not meeting the size requirements will be sorted into the Undersize Recycle, also referred to as dust recycle, which will be pneumatically transported to the 200 cubic yard Recycle and Dust (R&D) Bin, which also receives dust collection. These are then recycled back into the mixers.

- **Oversized Product Crumbler:**

Oversized material will be conveyed to a crumbler to break down the material to 100% passing a 3.0mm screen at 4-5 TPH. It will then be returned by way of a bucket elevator to be rescreened and ultimately loaded out into a bag.

- **Bulk Bag Loader:**

After the pelletized gypsum has been dried to approximately 2% moisture, it will be ready for bagging. An operator will set several pallets into the pallet loader, which will automatically set a pallet into place below the chute, and load a super sack, either a 1-ton or a 1.5-ton capacity bag, onto the chute where one ton of pelletized gypsum (59-61 pounds per cubic feet (lbs/cf)) will be released to fill the bag. Each bag will take approximately 7.5 minutes to fill. There will be two loading bays, so while one fills, the operator will be attending to the other bay in preparation for filling to begin. The operator will tie off the bag, sealing it with the least amount of air trapped inside as possible, label the totes, and the forklift will retrieve it and place it on the racking system. Approximately 50,714 tons/year will be produced for shipping in this system.

1.6. Processing Schedule

- 9/18/14 Received the application for a minor source air pollution construction permit.
- 10/13/14 Requested additional information.
- 11/6/14 Received additional information; application deemed complete.

2. PSD APPLICABILITY

The majority of the emissions related to this project are particulate matter resulting from the handling, drying and pelletizing of the gypsum. There will also be some additional products of combustion resulting from the firing of natural gas in the gypsum dryer. As provided in the application, **Table 1** summarizes potential emissions and PSD applicability for the project.

TABLE 1 - SUMMARY OF THE APPLICANT’S PSD APPLICABILITY ANALYSIS.

Pollutant	Annual Emissions, Tons/Year				Subject to PSD?
	Baseline Actual	Future Potential Emissions (TPY)	Potential Increase	Significant Emissions Rate	
CO	0	13	13	100	No
NO _x	0	7.9	7.9	40	No
PM	0	21.6	21.6	25	No
PM ₁₀	0	1.9	1.9	15	No
PM _{2.5}	0	0.76	0.76	10	No
SO ₂	0	0.031	0.031	40	No
Lead (Pb)	0	0.000026	0.000026	0.6	No
Mercury (Hg)	0	0.0002	0.0002	0.1	No
HAPs	0	0.10	0.10	25	No
CO ₂	0	6184	6184	75,000	No

As shown in the above table, the total project emissions will not exceed the PSD significant emissions rates; therefore, the current project is not subject to PSD preconstruction review.

3. DEPARTMENT REVIEW

3.1. Brief Discussion of Emissions and Applicable Requirements

Fugitive emissions of particulate matter will be emitted from the activities related to the handling of the gypsum within the facility (i.e., truck traffic, loader traffic) as well as point source emissions from the stacks of new baghouses that will be installed to control emissions from the gypsum handling, storing, drying, pelletizing and bagging portions of the process. There will also be small amounts of products of combustion (i.e., nitrogen oxides, carbon monoxide, etc.) generated and emitted to the atmosphere from the firing of natural gas in the gypsum pelletizer dryer; however, there are no unit specific applicable requirements that regulate the combustion emissions from the dryer burner. The applicant will be expected to employ best operating practices in order to properly maintain the burner and minimize these emissions. The fugitive emissions from the gypsum handling will be subject to work practice standards for the reasonable control of unconfined particulate matter. This project is subject to preconstruction new source review pursuant to Rule 62-212.300, F.A.C. As discussed above, this project is not subject to the PSD permitting requirements of Rule 62-212.400, F.A.C.; however, a minor source air construction permit is required in accordance with paragraph 62-210.300(1)(a), F.A.C., due to the requested modifications to the existing facility, which are subject to various state, federal and local program emissions limiting standards and requirements, as detailed below.

Because the applicant has requested particulate matter emissions limits more restrictive than the underlying applicable requirements for the regulated emissions points in order to specifically avoid the PSD applicability requirements of Rule 62-212.400, F.A.C., this project will be subject to the monitoring and reporting requirements in paragraph 62-212.300(1)(e), F.A.C. for a 5-year period following completion of the project. It is also noted in the application that the new building is being sized to accommodate a future additional production line. At such time that TEC desires to install an additional production line, the Department will make a determination regarding the aspects of project splitting to avoid PSD review. Depending on the timing and circumstances, it is possible that the Department will consider the construction of both lines as a single project and establish a Best Available Control Technology (BACT) determination as if this first production line had not yet been constructed. TEC

should plan to contact the Department prior to submitting an application for the future production line to establish whether or not a full PSD application will be required.

3.2. State Requirements

The project will include material storage and mixing bins and a dust suction manifold to control potential dust within the building while recovering usable product. Emissions from these operations will be controlled by a baghouse dust collector, which will be subject to pollutant numerical emissions limiting standards pursuant to Rule 62-296.711, F.A.C. and Chapter 1-3.52, Rules of the EPC. This controlled emissions point will be subject to a particulate matter emissions standard of 0.03 grains per dry standard cubic feet (dscf) of exhaust air and a visible emissions standard of not greater than 5% opacity. Pursuant to this rule, compliance with the opacity standard would relieve the permittee from the requirement to perform an annual particulate matter compliance stack test. However, the applicant has requested a permit limit of 0.010 grains per dscf in order to avoid being subject to the PSD requirements. Therefore, annual particulate matter compliance testing and PSD applicability reporting will be required for the first 5 years of operation. After that time, at least one particulate matter compliance test shall be performed every 5 years prior to renewing the Title V air operation permit. Annual visible emissions tests will also be required to demonstrate compliance with the opacity standard.

The remaining activities for the gypsum pelletizing project include; material handling of gypsum, transloading gypsum and gypsum pellets, bagging and pelletizing gypsum, mixers, fines recycle, weigh bins, binder day bins, and new storage pile locations. As is currently the case for the existing gypsum handling and storage system (emission unit 036), each of the new gypsum handling and storage emission activities that are not controlled by baghouses will qualify as an “unregulated emission unit” and will be added to the list of Unregulated Activities in the Title V air operation permit when it is revised to incorporate this project..

Subsection 62-296.320(2), F.A.C. (Objectionable Odor Prohibited), will apply to all of the new gypsum pelletizing emission sources and activities. Paragraph 62-296.320(4)(c), F.A.C. (Unconfined Emissions of Particulate Matter) will apply to emissions from unenclosed operations such as the gypsum storage piles.

3.3. Environmental Protection Commission of Hillsborough County Emission Standards

The Environmental Protection Commission (EPC) of Hillsborough County is a Department approved local program that has been delegated the primary responsibility for air source permitting and compliance in Hillsborough County.

EPC regulatory requirements for stationary air pollution sources are codified in Chapter 1-3 of the Rules of the Environmental Protection Commission of Hillsborough County. Chapter 1-3, Part 2, 1-3.21 (Permits Required) adopts a number of Department rules by reference including 62-4 (Permits), 62-210 (Stationary Sources – General Requirements), 62-212 (Stationary Sources – Preconstruction Review), 62-213 (Operation Permits for Major Sources of Air Pollution), and 62-214 (Requirements for Sources Subject to the Federal Acid Rain Program). General prohibitions are addressed in Chapter 1-3, Part 2, 1-3.22. These general prohibitions include provisions pertaining to compliance with ambient air quality standards, applicable emission standards, and objectionable odor.

Similarly, Chapter 1-3, Part 5, 1-3.50 (Emission Limiting and Performance Standards) adopts Department Chapter 62-204, F.A.C. (Air Pollution Control – General Provisions) and 62-296, F.A.C. (Stationary Sources – Emission Standards) by reference. General visible emission standards are contained in Chapter 1-3, Part 5, 1-3.52. A general opacity standard of 20 percent applies to all stationary sources while a general five percent opacity standard applies to a broad subset of stationary sources including the loading or unloading of materials to and from containers such as railcars, trucks, ships, storage structures and stockpiles, permanent conveyor systems, storage of materials in structures such as silos or enclosed bins, which have a storage capacity of fifty cubic yards or more, crushing, grinding, sizing and screening operations, and static drop transfer points. The general five percent opacity standard does not apply to emissions of particulate matter from open stockpiles of materials, vehicular traffic and other emissions from roads and plant grounds.

3.4. Federal NSPS Provisions

The gypsum dryer/pelletizer/cooler consist of a burner assembly, a fluidized bed conveyor where the gypsum is dried, formed into pellets and cooled, and a dust collector baghouse for capturing usable gypsum and reducing particulate matter emissions to the atmosphere. The burner assembly, which is rated at 12 MMBtu/hr, will be used

to dry the gypsum pellets. The burner system is an internal combustion source that will fire natural gas to directly heat the fluidizing air and fluidizing bed in the dryer system. Combustion emissions from the dryer burner will exhaust through the dryer/cooler baghouse stack; therefore, the new gypsum dryer stack will be subject to pollutant numerical emissions limiting standards pursuant to 40 CFR 60, Subpart UUU – Standards of Performance for Calciners and Dryers in Mineral Industries. Subpart UUU establishes limits on emissions of particulate matter from the dryer/cooler stack of 0.057 grams per dry standard cubic meter (g/dscm) (0.025 grains per dry standard cubic foot (gr/dscf)), and a limit on visible emissions from the dryer stack of 10% opacity. However, the applicant has requested a permit limit of 0.010 grains per dscf in order to avoid being subject to the PSD requirements. Annual particulate matter compliance testing and PSD applicability reporting will be required for the first full 5 years of operation. After that time, at least one particulate matter compliance test shall be performed every 5 years prior to renewing the Title V air operation permit. Annual visible emissions tests will also be required to demonstrate compliance with the opacity standard.

In addition, pursuant to 40 CFR 60.734, for this fluidized bed gypsum dryer, TEC is required to install, calibrate, maintain and operate a continuous opacity monitoring system (COMS) to measure and record the opacity emissions discharged into the atmosphere from the baghouse. The COMS shall comply with certification and operation requirements contained in 40 CFR 60.13. Pursuant to 40 CFR 60.13(c), if TEC elects to submit continuous opacity monitoring system (COMS) data for compliance with the opacity standard as provided under 40 CFR 60.11(e)(5), they shall conduct a performance evaluation of the COMS as specified in Performance Specification 1, Appendix B, of 40 CFR 60 before the performance test required under 40 CFR 60.8 is conducted.

3.5. Federal NESHAP Provisions

There are no National Emission Standards for Hazardous Air Pollutants (NESHAP) that are applicable to the new gypsum pelletizing and storage emission sources. Because the burner exhaust is in direct contact with the gypsum in the fluidizing bed dryer, the burner does not meet the definition of a “process heater” and is not subject to the requirements of 40 CFR 63, Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters.

3.6. Other Draft Permit Requirements

Reasonable precautions to prevent emissions of unconfined particulate matter shall be employed for all activities related to the handling and transporting of gypsum as necessary, including but not limited to the watering of roads and storage piles, covering dump trucks during transit, the use of water spray bars across the door openings to the gypsum processing building, proper maintenance of the dust collectors at transfer points within the building to minimize fugitive dust in the work area, filters on the building ventilation exhaust to reduce emissions of entrained dust from the work area, etc.

Because the raw material for this gypsum pelletizing project is produced as a by-product of the wet scrubbers that are relied upon to reduce atmospheric mercury emissions from the coal-fired steam generating units at the Big Bend Generating Station, the Department has concerns about the possible re-volatilization of mercury to the atmosphere during the drying portion of this gypsum processing project. In order to verify TEC’s claims that mercury will not be emitted from the gypsum dryer stack, the permit will require mercury concentration testing of the wet gypsum at the inlet and the outlet of the new gypsum processing operation on a monthly basis to determine the ultimate fate of the mercury released from the burning of the coal and captured into the gypsum created by the scrubber. TEC shall compare the inlet and outlet concentrations of mercury in the samples and submit a report that details the fate of the mercury to the Department within 45 days of taking the samples. 100% of the difference between the inlet and outlet concentrations will be assumed to have been emitted to the atmosphere from the dryer/pelletizer/cooler baghouse vent stack. If a minimum of six sample reports confirm that only negligible amounts of mercury are emitted to the atmosphere from this activity, TEC may request that these sampling and reporting requirements be terminated and may discontinue them upon written concurrence from the Department.

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. Jon Holtom, P.E., 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 Blair Stone Road, Tallahassee, Florida 32399-2400.