TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

APPLICANT

Cedar Bay Generating Company, L.P.

Post Office Box 26324
9640 Eastport Road
Jacksonville, Florida 32226

Cedar Bay Generating Plant
Facility ID No. 0310337

PROJECT

Draft Permit Revision No. 0310337-018-AC
Fuel Sampling, Ammonia, Metals Testing and Material Handling

COUNTY

Duval 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

March 20, 2014

1. GENERAL PROJECT INFORMATION

1.1. Facility Description and Location

This facility, which is shown in **Figure 1**, is an existing power plant, which is categorized under Standard Industrial Classification Code No. 4911. This existing plant is located in Duval County at 9640 Eastport Road, Jacksonville, Florida. The UTM Coordinates are: Zone 17, 441.08kilomeeters (km) East and 3365.06 km North; Latitude: 30° 25' 21" North and Longitude: 81° 36' 23" West.

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. Cedar Bay Generating Plant.

A summary of the regulated existing emission units and corresponding emissions unit identification numbers (E.U. ID No.) within the Department's Air Resource Management System (ARMS) at the Cedar Bay Generating Plant is given below. The emission unit affected by this permitting action is highlighted in turquoise in the **Table 1**.

TABLE 1 - EMISSION UNITS AT THE CEDAR BAY GENERATING COGEN PLANT.

EU ID No.	Brief Description
Regulated Emissions Units	
001	Circulating Fluidized Bed Boiler A – 1063 million British thermal units (MMBtu)/hour
002	Circulating Fluidized Bed Boiler B - 1063 MMBtu/hour
003	Circulating Fluidized Bed Boiler C - 1063 MMBtu/hour
004	Absorber Dryer System Train - 1 (Dryer and Handling System)
005	Absorber Dryer System Train - 2 (Dryer and Handling System)
006	Coal Crusher Building
007	Coal Silo Conveyor
009, 025	Absorber Dryer System (ADS) Storage Bins (1 & 2)
010	Bed Ash Hopper
011	Bed Ash Separator/Collector
012, 026	Fly Ash Separators/Collectors (1 & 2)
020	Coal Car Unloading

EU ID No.	Brief Description
030	Dry Ash Rail Car
031	Pulverized Limestone Feeders (6)
032	Bed Ash Silo Vent (for transfers to silo and emissions control for truck loadout)
033	Fly Ash Silo Vent (for transfers to silo and emissions control for truck loadout)
034	Absorber Dryer System Train - 3 (Dryer and Handling System)

1.2. Facility Regulatory Categories

1.2.1. Federal Regulations

The U.S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40, Code of Federal Regulations, Part 60 (40 CFR 60) that identifies New Source Performance Standards (NSPS) for a variety of industrial activities. 40 CFR 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP). 40 CFR 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology (MACT) for given source categories.

Federal regulations adopted by reference are given in Rule 62-204.800, F.A.C. State regulations approved by EPA are given in 40 CFR 52, Subpart K – Florida; also known as the State Implementation Plan (SIP) for Florida. The following federal regulations apply to the Cedar Bay Generating Plant.

- The facility is a major source of hazardous air pollutants (HAP).
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is 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 includes units subject to the New Source Performance Standards (NSPS) of Title 40 Code of Federal Regulations (CFR) Part 60.
- The facility includes units subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.
- The facility includes units subject to Clean Air Interstate Rule (CAIR).
- The facility has units subject to the acid rain provisions of the Clean Air Act (CAA).

1.2.2. State 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 air quality regulations as part of the Florida Administrative Code (F.A.C.), which includes the applicable chapters contained in **Table 2**.

TABLE 2. APPLICABLE RULES FROM THE F.A.C.

Chapter	Description
62-4	Permits
62-17	Electrical Power Plant Siting
62-204	Air Pollution Control – General Provisions
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Stationary Sources – Preconstruction Review
62-213	Operation Permits for Major Sources (Title V) of Air Pollution
62-296	Stationary Sources – Emission Standards
62-297	Stationary Sources – Emissions Monitoring

1.3. Application Processing Schedule

Application for an Air Construction Permit Revision received on January 8, 2014. Application deemed complete.

1.4. 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 this permit

1.5. Project Description

The applicant requested an air construction permit revision to change several conditions related to fuel sampling, ammonia and metals testing and the material handling systems at the facility.

2. PSD APPLICABILITY

2.1. General PSD Applicability

The Department regulates major stationary sources in accordance with Florida's PSD program pursuant to Rule 62-212.400, F.A.C. PSD preconstruction review is required in areas that are currently in attainment with the state and federal ambient air quality standards (AAQS) or areas designated as "unclassifiable" for these regulated pollutants. Commonly addressed PSD pollutants in the power industry include: carbon monoxide (CO), NO_X, particulate matter (PM), PM with a mean diameter of 10 microns or less (PM_{10}), PM with a mean diameter of 2.5 microns or less ($PM_{2.5}$), sulfur dioxide (SO_2), volatile organic compounds (VOC), lead (Pb), fluorides (F), sulfuric acid mist (SAM), and mercury (Hg).

Additional PSD pollutants that are more common to certain other industries include: hydrogen sulfide (H_2S), TRS including H_2S, reduced sulfur compounds (RSC) including H_2S, municipal waste combustor (MWC) organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans (dioxin/furan), MWC metals measured as PM; MWC acid gases measured as SO_2 and HCl, and MSW landfill emissions as non-methane organic compounds (NMOC).

As defined in Rule 62-210.200(189)(a)1, F.A.C., a stationary source is a "major stationary source" (major PSD source) if it emits or has the potential to emit (PTE):

- 250 tons per year (TPY) or more of any PSD pollutant; <u>or</u>
- 100 TPY or more of any PSD pollutant <u>and</u> the facility belongs to one of the 28 listed PSD major facility categories.

The list given in the citation includes the category of "fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input". This category applies to the Cedar Bay Generating Plant before and after the proposed project. The Cedar Bay Generating is a major stationary source based on actual emissions of and potential to emit 100 TPY or more of several individual PSD pollutants.

For major stationary sources such as the Cedar Bay Generating Plant, PSD applicability for modification projects is based on thresholds known as the significant emission rates (SER) as defined in Rule 62-210.200(274), F.A.C. Any "net emissions increase" as defined in Rule 62-210.200(204), F.A.C. of a PSD pollutant from the project that equals or exceeds the respective SER is considered "significant". SER also means any emissions rate or any net emissions increase of a PSD pollutant associated with a major stationary source or major modification which would construct within 10 km of a Class I area and have an impact on such area equal to or greater than 1 gram per cubic meter, 24-hour average.

Although a facility may be "major" (i.e. emits or has the potential to emit 100 or 250 TPY as applicable) for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding SER given in **Table 3**.

According to 40 CFR 52.21, six greenhouse gases (GHG), are also subject to regulation at new stationary sources that will emit or have the potential to emit 100,000 TPY expressed as the carbon dioxide equivalent emissions (CO_2e). The PSD SER for CO_2e is 75,000 TPY. This requirement has not been incorporated into Department rules but is a separate requirement of the EPA.

TABLE 3. LIST OF SER BY PSD-POLLUTANT. [1]

Pollutant	SER (TPY)	Pollutant	SER (TPY)
CO	100	NO_X	40
$PM/PM_{10}/PM_{2.5}$	25/15/10	Ozone (VOC) [2]	40
$PM_{2.5}$ (NO_X)	40	$PM_{2.5}$ (SO_2)	40
Ozone (NO_X) [2]	40	SAM	7
SO_2	40	Pb	0.6
Hg	0.1	GHG (CO_2e)	75,000 [3]

1. Excluding fluoride and those pollutants defined for Pulp and Paper, MWC, MSW landfills.
2. Ozone (O_3) is regulated by its precursors (VOC and NO_X). PSD for $PM_{2.5}$ can be triggered by its precursors (NO_X and SO_2).
3. GHG is subject to federal regulation for projects at this stationary source that will result in an emissions increase 75,000 TPY of GHG (as CO2e) or more. GHG regulations have not been incorporated into Department rules. FPL has submitted an PSD GHG application to EPA region 4 in Atlanta, GA.

2.2. PSD Applicability for Project

The project will revise permit conditions related to fuel sampling, ammonia and metals testing and the material handling systems at the facility. There will be slight emissions increases as explained below and the project is not subject to PSD preconstruction review.

3. DEPARTMENT REVIEW

3.1. Response to Requested Revisions

The applicant requested changes to previous air construction permits are explained below along with the Department's response. Requested changes are highlighted in yellow with additions denoted with double-underline and deletions denoted with ~~strikethrough~~.

3.1.1. Request 1

Specific Condition A.7. of the facility's Title V permit stipulates that the fuel input to the CFB units shall not exceed 3.2 lb/MMBtu equivalent SO_2 content and that compliance shall be determined on a monthly basis via a composite of daily fuel samples. Cedar Bay requests the removal of language for the requirement of daily fuel samples and instead allow the percent sulfur analyses provided by the coal supplier to be used instead.

Cedar Bay's boilers are subject to 40 CFR Part 60, Subpart Da-Standards of Performance for Electrical Utility Steam Generating Units for Which Construction is Commenced after September 18, 1978. The boilers are circulating fluidized bed boilers where acid gas scrubbing takes place within the combustor itself. 40 CFR Part 60, Subpart Da, 60.43(a) (2) stipulates a minimum of seventy percent reduction of potential sulfur dioxide emissions when SO_2 emissions are less than 0.60 pounds per million British thermal units (lbs/MMBtu). Due to the configuration of a circulating fluidized boiler Cedar Bay is obligated to demonstrate compliance with the SO_2 percent reduction requirements through the use of outlet SO_2 continuous emissions monitoring system (CEMS) and calculated inlet concentrations of SO_2 based on the percent sulfur in the coal in accordance with 40 CFR Part 60, Appendix A-7, Method 19, Equation 19-25. The facility CEMS provides the SO_2 reduction on an hourly, daily basis and 30-day rolling average basis.

Cedar Bay's existing SO_2 lbs/MMBtu limit is 0.3 lbs/MMBtu (3-hour rolling average) and 0.2 lbs/MMBtu (12-month rolling average.). These limits are more restrictive than the SO_2 limits allowed in 40 CFR Part 60, Subpart Da.

The coal quality parameters/limits in the commercial agreement with the facility's coal supplier reflects the maximum sulfur requirements of purchased coal to ensure permit compliance. Specifically, there is a monthly performance suspension limit (on a weighted average basis for deliveries in each month) of > 1.2% sulfur and a per shipment rejection limit if the sulfur is greater than 1.35%. As the typical BTU value of delivered coal has little deviation from 12,000 Btu per pound, the fuel input is not process capable of exceeding the 3.2% lb/MMBtu equivalent SO_2 content.

Due to the commercial agreement the coal supplier is obligated to supply percent sulfur and Btu value for each shipment of coal. The coal supplier follows ASTM standards for obtaining a coal sample and the supplier's fuel laboratory analyzes for sulfur content in accordance with the ASTM procedures specified in 40 CFR Part 60, Appendix 40 A-7, Method 19. Cedar Bay believes that daily as-fired sampling and subsequent analyses provides data that is already available as well as being an unnecessary administrative burden.

Cedar Bay proposes that the percent sulfur determination provided by the coal supplier's fuel laboratory be utilized in the facility's CEM system as a rolling average in lieu of daily as-fired sampling and that Specific Condition **A.7.a.** of the Title V air operation permit be revised as follows:

A.7. Sulfur Dioxide - Sulfur Content.

a. Fuel. The fuel input to the CFB units shall not exceed 3.2 lb/MMBtu equivalent SO_2 content. Compliance shall be determined ~~on a monthly basis via a composite of daily fuel samples~~ from the ASTM results provided for each coal train as a rolling average.

The Department agrees with this revision request.

To effect this change, Permit 0310337-005-AC is revised as follows:

II.A. Emissions Limitation for CPCB Boilers

1. **Fluidized Bed Coal Fired Boilers**

d. The sulfur content of the coal shall not exceed 1.2%, by weight, on an annual basis. The sulfur content shall not exceed 1.7%, by weight, on a shipment (train load) basis. When cofiring coal and petcoke, the blended fuel input to the CFBs shall not exceed 3.2 lb/MMBtu equivalent SO2 content. Compliance shall be determined ~~on a monthly basis via a composite of daily fuel samples~~ from the ASTM results provided for each coal train as a rolling average.

3.1.2. Request 2

The facility utilizes low sulfur #2 fuel oil for start-up of the boilers. On extremely rare occasions, it may be also be used for short durations to sustain operations when there are temporary interruptions of coal feed due to malfunctions of the coal feed system. However, fuel oil cannot be used for sustained operations of the boilers. Each combustor is equipped with six start-up oil burners that collectively can supply a maximum of 68 MMBtu/hr (6% of maximum continuous rating). The boiler's distributed control system (DCS) has a temperature permissive that will not allow the non-selective catalytic system to operate until a specific temperature is reached. This particular temperature cannot be achieved until coal is combusted. The reason for this control logic is that there is no need to operate the non-selective catalytic reduction system for NO_X as the generation of NO_X is very small while firing fuel oil. As such, Cedar Bay requests that the reference for testing ammonia (NH_3) slip limits from exhaust gases when burning fuel oil be modified in **Section III, Specific Condition A.8.** of the Title V air operation permit be revised as follows:

A.8. Ammonia. Ammonia (NH_3) slip from exhaust gases shall not exceed 10 ppmvd when co-firing pet coke or burning coal at 100% capacity as measured by applicable test methods and 30 ppmvd when burning No. 2 fuel oil as demonstrated by operating records (fuel flow, ammonia flow) ~~measured by applicable test methods~~. . [PSD-FL-137(A), Specific Condition A.4.; 0310337-018-AC, Specific Condition 2.]

The Department agrees with this revision request.

To effect this change, Permit 0310337-005-AC is revised as follows:

II.A. Emissions Limitation for CPCB Boilers

4. Ammonia (NH_3) slip from exhaust gases shall not exceed 10 ppmvd when co-firing petcoke or burning coal at 100% capacity as measured by applicable test methods and 30 ppmvd when burning No. 2 fuel oil as demonstrated by operating records.

3.1.3. Request 3

Cedar Bay receives limestone via dump trucks. Average tonnage of the limestone per truckload is 19 tons. The trucks normally will run in tandem. The process of loading at the Dames Point terminal, transport to the facility, unloading the limestone at the designated storage area, return for re-loading and return to the facility typically

takes more than an hour. However, there is always the potential for periodic disruptions in delivery that could potentially require Cedar Bay to require more than several trucks to deliver the limestone so that there is adequate inventory of limestone for acid gas control. To provide operational flexibility and to ensure adequate limestone inventory Cedar Bay requests the deletion for the requirement for the maximum limestone delivery of 44 tons/hour. The maximum permitted capacity of limestone specified in **Specific Condition B.1.(a).** would remain the same (385,400 tons).

ADS Train #3 was originally permitted via PSD permit No. 0310337-011-AC. The particulate matter testing (Method 5) was conducted on August 24, 2007. The testing on ADS Train #3 demonstrated that emissions were well below the 0.003 gr/dscfm level. In addition, opacity has been much less than 5%. A review of the compliance testing operational parameters indicates that the volumetric flow is greater than 17,500 and typically runs at 22,800 dscfm with a recorded maximum of 23,396 dscfm. Based on calculations with the actual volumetric flow, the equivalent emissions increased from 0.45 to 0.56 lbs/hr and from 1.97 to 2.5 tpy, a net change of 0.5 tons.

To accurately reflect the correct volumetric flow, Cedar Bay requests that the **Section III, Specific Condition B.1.d..** of the Title V air operation permit be revised as follows:

B.1.d. Permitted Capacity. The maximum material feed rate to ADS Train 3 shall not exceed 44.0 tons per hour and the volumetric flow rate shall not exceed ~~17,500~~ 24,000 dscfm.

The Department agrees with this revision request.

To effect these changes, Permit 0310337-011-AC is revised as follows:

4. Permitted Capacity: The maximum handling/usage rates for ADS Train 3 for all limestone/aragonite unloading and storage shall not exceed ~~44 tons/hour and~~ 385,400 tons during any 12 consecutive months of limestone and aragonite and the volumetric flow rate shall not exceed 24,000 dscfm. [Application No. 0310337-011-AC, Rule 62-210.200(PTE), F.A.C.]

3.1.4. Request 4

Specific Condition A.33. of the facility's Title V air operation permit stipulates that Cedar Bay is required to perform annual compliance tests for PM, PM_{10}, CO, SO_2, NO_X and visible emissions. **Specific Condition A.35.** stipulates a testing frequency (every 5 years) for mercury (Hg), beryllium (Be), and lead (Pb) during the first, fifth and tenth years of operation and once every 5 years following successful testing from the three prior tests. The results from stack testing since the facility began operation has provided results of these parameters well below permit limits.

Cedar Bay is a facility impacted by 40 CFR 63 Subpart UUUUU (the Mercury and Air Toxics Rule). As such, the facility will have a new regime of compliance testing effective April 16, 2015. Filterable PM will be the facility's surrogate for non-mercury HAP metals. The PM limit in Subpart UUUUU is 0.03 lb/MMBtu compared to Cedar Bay's BACT PM limit of 0.018 lb/MMBtu. Additionally, the facility will be obligated to demonstrate that each of the three combustors is a low-mercury emitter. Cedar Bay will be obligated to have mercury testing (Method 30B for 30 operating days per boiler) for three successive years and once every three years following the annual requirement.

In consideration of the testing requirements identified in the Mercury and Air Toxics Rule and the use of PM as a surrogate for non-mercury HAP metals compliance, Cedar Bay requests that **Specific Conditions A.33.** and **A.35.** of the Title V air operation permit be revised as follows:

A.33. Annual Compliance Tests Required. Annual compliance tests shall be performed for ~~PM,~~ PM_{10}, CO, SO_2, NO_X and visible emissions.

A.35. Additional Compliance Tests. ~~Compliance tests shall be performed for Hg, Be, and Pb until three consecutive tests (including, if successful, the initial compliance test) are within the annual emission limits specified in Specific Condition A.5. Such tests shall occur, as necessary, in the first, fifth and tenth years and additional successive five year intervals following commercial operation. Mercury testing shall not be routinely required. However, should the Department have reason to believe that a change in mercury emission has occurred (e.g. via a change in fuel quality, particulate removal equipment, etc.) mercury testing shall be required [PA 88-24(A); and PSD-FL-137(D)].~~ Annual compliance test for PM shall be performed until April 16, 2015 when testing requirements for the Mercury and Air Toxics Rule

become effective.

The Department agrees with this revision request.

To effect these changes, Permit PSD-FL-137A is revised as follows:

II.A.8. Compliance Test for each CFB

b. Annual compliance tests shall be performed for ~~PM,~~ CO, SO_2 and NO_X, commencing no later than12 months from the initial test.

And Permit PSD-FL-137D is revised as follows:

II.A.2. Coal Fired Boiler Controls

c. ~~Mercury testing shall not be routinely required. However, should the Department have reason to believe that a change in mercury emissions has occurred (e.g., via a change in fuel quality, particulate removal equipment, etc.) mercury testing shall be required.~~ Annual compliance testing for PM shall be performed until April 16, 2015, when testing requirements for the Mercury and Air Toxic Rule become effective.

3.1.5. Request 5

In addition to the modification request for integrating the parameters to be tested pursuant to the Mercury and Air Toxics Rule (MATS), Cedar Bay requests that the Department eliminate the facility's Beryllium limit as designated in **Specific Condition A.5.** of the Title V air operation permit and beryllium test method listed in **A.31.** as beryllium is no longer a PSD Pollutant.

The Department agrees with this revision request.

To effect these changes, permit PSD-FL-137A is revised as follows:

II.A.8. Compliance Test for each CFB

a. Initial and subsequent compliance tests for PM/PM_{10}, SO_2, NO_X, CO, VOC, lead, fluorides, ammonia, mercury, ~~beryllium~~ and H_2SO_4 mist, shall be conducted in accordance with 40 CFR 60.8(a), (b), (c), (d), (e) and (f).

e. The following test methods and procedures pursuant to Chapter 17-297, F.A.C., and 40 CFR 60 and 61, or by equivalent methods after obtaining prior written Department approval, shall be used for compliance testing:

~~(16) Method 104 for beryllium.~~

3.1.6. Request 6

Specific Condition B.13. in the Title V air operation permit stipulates annual visible emission compliance tests for all emission units in this section. Emission Unit #31 is comprised of (6) pulverized limestone feeders. Each feeder is equipped with a small baghouse and outlet fan less than 4 inches in diameter. The feeders are located inside the confines of the power block. Equivalent emission for each feeder is 0.001 tpy. Due to the size of the individual feeders that comprise the Emission Unit and due to the interior location of the feeders Cedar Bay requests that visible emissions testing for EU #31 be reduced to once every five years. Cedar Bay requests that **Specific Conditions B.13.** of the Title V air operation permit be revised as follows:

B.13. Annual Tests Required. Annual visible emissions compliance tests shall be performed for all emissions units in this subsection with the exception of the pulverized limestone feeders. Due to the size of the individual feeders that comprise the emission unit and due to the interior location of the feeders, visible emissions testing shall be conducted once every five years. [Rule 62-297.310(7), F.A.C.; and, PSD FL-137(A & E), Specific Condition B.9.; 0310337-018-AC, Specific Condition 4.]

The Department agrees with this revision request.

To effect this change, Permit PSD-FL-137A is revised as follows:

II.B CBCP - Material Handling and Treatment

9. Initial and annual PM emissions and VE compliance tests for all the emissions points in the material handling and treatment area, with the exception of the pulverized limestone feeders, including but not

limited to the sources specified in this permit, shall be conducted in accordance with the July 1, 1992, version of 40 CFR 60, Appendix A, using EPA methods 5 and 9, respectively. Due to the size of the individual feeders that comprise the emission unit and due to the interior location of the feeders, visible emissions testing shall be conducted once every five years.

3.1.7. Request 7

Cedar Bay requested that the Department add a permitting note to define the reason for heat input limitations as it has done in other Title V permits. This request was not adopted because the heat limit limits in the permit are based on an underlying air construction permit.

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.

Tom Cascio is the project engineer responsible for reviewing the application and drafting the permit revision. Additional details of this analysis may be obtained by contacting him by telephone at 850/717-9077 or by e-mail at tom.cascio@dep.state.fl.us in the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.