TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Miami-Dade Water and Sewer Department
P.O. Box 330316
Miami Florida 33233-0316
South District Wastewater Treatment Plant
Facility ID No. 0250520

PROJECT

Project No. 0250520-019-AC
Application for Air Construction Permit

COUNTY

Miami-Dade, Florida

PERMITTING AND COMPLIANCE AUTHORITY

Florida Department of Environmental Protection
Air Resource Section Southeast District Office
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

October 8, 2012

1. GENERAL PROJECT INFORMATION

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 Rules 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 on a quarterly basis in Rule 62-204.800, F.A.C.

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.

Facility Description and Location

Miami-Dade Water and Sewer Department South District Wastewater Treatment Plant is an existing publicly owned wastewater treatment plant with a capacity of 112.5 million gallons per day based on annual average daily flow, and peak hourly flow of 285 million gallons. Liquid processes at the facility include aerated grit chambers, oxygenation tanks, sludge concentration tanks, secondary clarifiers and chlorine contact basins, which is categorized under Standard Industrial Classification Code No. 4952. The facility is located in Miami-Dade County at 8950 SW 232nd Street in Miami, Florida. The UTM coordinates of the existing facility are Zone 17, 566.455 km East, and 2825.89 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).

Facility Regulatory Categories

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility has no 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 213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Project Description

- The facility proposes to remove two existing Low-BTU fuel 900 kW Superior Engine-Generators and replace with four new Low-BTU fuel 2,000 kW (each) Cummins Engine-Generators (C2000 N6 Low-BTU fuel at 1.0 g NOx/BHP-hr spark-ignition lean-burn internal combustion engine.)
- Install a heat recovery system for thermal energy recovery from engine-generator jacket water and exhaust gas. Heat recovered from the engine-generator jacket water will be used to heat the existing mesophilic anaerobic digesters at the plant. Heat recovered from engine generator exhaust gas will be used to heat hot thermal oil which will be used to fuel an absorption chiller (this project) and to provide heat for a sludge drying system (future project). The absorption chiller will generate chilled water to be used for digester and

landfill gas cooling and for HVAC cooling. Excess engine-generator jacket water heat and all engine-generator auxiliary water heat (e.g., lube oil/intercooler heat) will be wasted using existing plant effluent water.

- Install improvements to the existing Digester Gas Conditioning system including iron sponge technology for hydrogen sulfide removal, gas cooling technology for moisture removal, and gas pressure booster blowers to increase operating pressure.
- Install a Landfill Gas Conditioning system at the SDWWTP including gas cooling technology for moisture removal, and gas pressure booster blowers to increase operating pressure. Under a separate project, a landfill gas treatment system was recently installed at the adjacent South Miami-Dade County Landfill consisting of moisture removal and gas compression, and an 8-inch pipeline was also installed to convey the gas from the landfill gas treatment system to the SDWWTP cogeneration facility.
- Utilize the two existing 60-foot diameter gas storage spheres for conditioned digester and landfill gas storage and blending. Each engine-generator will be equipped with requisite gas train and blending systems to allow the engine to be operated on digester gas, landfill gas, or a blend of digester and landfill gas with or without supplemental natural gas to increase fuel caloric value. The engine-generators will also have the ability to operate solely on natural gas.

Processing Schedule

July 16, 2012 Received construction permit application for a TV source.

2. PSD APPLICABILITY

General PSD Applicability

For areas currently in attainment with the state and federal AAQS or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant; or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, Portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); fluorides (Fl);

sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the potential emission exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be *major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

3. APPLICATION REVIEW

Discussion of Emissions

The permit application seeks to increase the collective total hours of operation to 24,250 hours (215 tons/yr CO) in any 12-month period for the bank of five (5) units as follows:

- Existing Emission Unit ID 001 is capped at 2,000 hours/yr (10 tons/yr CO)
- New Emission Units ID 015-018 are capped at a combined total of 22,250 hours/yr (205 tons/yr CO)

Historically, usage of the emergency and cogeneration engines has been limited in order to keep NOx emissions from triggering PSD. NOx emissions have been greater than any other pollutant. However, the four (4) new engines proposed for the cogeneration system have much lower NOx emission rates. As a consequence, CO emissions will exceed NOx emissions. Therefore, in order to avoid PSD, the site will be limited by CO emissions. No changes are proposed in the limitations for the existing emergency generators. The hour of use limitations for the cogeneration engines can increase substantially above the historical limitations because of the lower emission rates of the new engines, while keeping the site-wide CO mass emissions below 250 tons/yr (240 tons/yr for all the sources on site proposed).

State Requirements

Chapter 62-4

Chapter 62-204

Chapter 62-210

Chapter 62-212

Chapter 62-213

Chapter 62-296

Chapter 62-297

Federal NSPS Provisions

40 CFR 60, subpart JJJJ

Federal NESHAP Provisions

NSPS 40 CFR 63, subpart ZZZZ

Emission Guidelines (40 CFR Part 60)

Units Subject to NESHAP (40 CFR Part 61 or Part 63)

4. PRELIMINARY DETERMINATION

The Department Southeast District Office 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. Lee C. Hoefert is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting Lee C. Hoefert at the Department of Environmental Protection Southeast District Office, 400 North Congress Avenue, Suite 200, West Palm Beach, Florida 33401.