



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

Cornwell  
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JUN 13 2011

AIR PROTECTION BRANCH

June 7, 2011

Mr. James Capp, Chief  
Air Protection Branch  
Environmental Protection Division  
Georgia Department of Natural Resources  
4244 International Parkway, Suite 120  
Atlanta, Georgia 30354

Dear Mr. Capp:

Thank you for sending the Prevention of Significant Deterioration (PSD) permit application for the Effingham County Expansion Project. Mackinaw Power, the applicant, proposes to expand the existing Effingham Power Plant located west of Rincon, Georgia. The modification will add two 180 megawatts (MW) combined cycle combustion turbines (CTs) that will primarily combust natural gas with ultra low sulfur fuel oil (0.0015% S) combusted as backup fuel. The CTs include two heat recovery steam generators (HRSGs) and two duct burners. The project will have a total nominal gross generating capacity of 685 MW. The expansion will also include the addition of one 14 MMBtu/hr natural gas auxiliary boiler, a fuel gas heater, a 10-cell mechanical draft cooling tower, a 6-cell cooling tower, and a fuel oil storage tank. The proposed project is subject to PSD review for the following pollutants: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM, PM<sub>10</sub>, and PM<sub>2.5</sub>), volatile organic compounds (VOC), and greenhouse gases (GHGs).

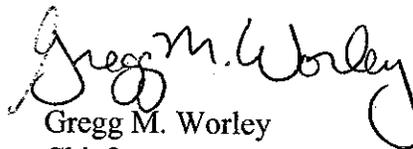
Based on our review of the PSD permit application we have the following comments:

1. Tables corresponding to sections in the best available control technology (BACT) analysis for CTs do not fully support the proposed limits. Sections 4.2 and 4.3 (page 28-48) provide an overview of the section and a detailed BACT analysis for the CTs, respectively. These sections propose a higher BACT for CO, VOCs, and PM when the CTs run with duct firing. However, the corresponding BACT determination tables in the appendices, (Tables 4-3 through 4-6, 4-9, and 4-10), only show limits for CTs without duct firing as opposed to with duct firing. The applicant should provide additional BACT tables or rationale to demonstrate the necessity of these higher limits.
2. In reference to the cooling towers, it is unclear how footnote "d" was used to calculate the values in Table 2-5. A more detailed explanation of the calculations should be provided. Also, Table 4-13 provides a summary of the BACT for cooling towers. Several facilities have drift eliminators with a maximum drift rate of 0.0005%, (e.g., FPL West County Energy Center Unit 3, FL). However, the applicant proposed in section 4.6, to use a drift eliminator with a maximum drift rate of 0.001% (page 49). The applicant should elaborate why a drift eliminator with 0.0005% drift rate is cost prohibitive. They should provide a cost analysis and a cost effectiveness value in section 4.6 before this option is eliminated.

3. It is our understanding that there are NO<sub>x</sub> BACT limits currently in permits that are lower than those proposed in the application. The applicant intends to use selective catalytic reduction to obtain limits of 2.5 ppmvd @15% O<sub>2</sub> when firing natural gas and 10 ppmvd @15% O<sub>2</sub> when firing fuel oil. As contained in Table 4-1 of the appendices, a multitude of facilities with similar natural gas-fired CTs in Region 4 have a NO<sub>x</sub> limit of 2.0 ppmvd @15% O<sub>2</sub> (e.g., FPL Turkey Point Power Plant, FL). In Table 4-2 of the appendices, several facilities with similar fuel oil-fired CTs have a NO<sub>x</sub> limit lower than 10 ppmvd @15% O<sub>2</sub> (e.g., McIntosh Combined Cycle Facility, GA at 6 ppmvd; Tenaska Bear Garden Station, VA at 2.5 ppm). Based on review of the information available, the lower NO<sub>x</sub> limits are technically feasible and should be considered as an option in the BACT analysis.
4. It is our understanding that there are VOC BACT limits currently in permits that are lower than those proposed in the application. The applicant proposed limits of 1.4 ppmvd with natural gas-firing and 3.5 ppmvd with fuel oil-firing. In Table 4-5 of the appendices, many facilities with similar natural gas-fired CTs in Region 4 have a VOC limit of 1.2 ppmvd @15% O<sub>2</sub> using good combustion practices, (e.g., Progress Bartow Power Plant, FL). As contained in Table 4-6, a fuel oil-fired facility in Region 4 has a VOC limit for fuel oil-fired CTs of 2.5 ppmvd @ 15% O<sub>2</sub>. Based on review of the information available, the lower VOC limits are technically feasible and should be considered as an option in the BACT analysis.
5. In Table 4-9 of the appendices, a number of facilities with similar natural gas-fired CTs in Region 4 have a PM limit of .0054 lb/MMBtu, (e.g., Live Oaks Power Project, GA). This value is lower than 0.0084 lb/MMBtu, the PM limit proposed by the applicant. Based on review of the information available, the lower PM limits are technically feasible and should be considered as an option in the BACT analysis.
6. As contained in Table 4-11 of the appendices, facilities with auxiliary boilers emitting NO<sub>x</sub> have a limit as low as 0.011 lb/MMBtu (e.g., CPV St. Charles, MD); boilers emitting PM have limits as low as 0.0033 lb/MMBtu, and CO limits of 0.02 lb/MMBtu. Based on review of the information available, these lower limits are technically feasible and should be considered as an option in the BACT analysis.

We understand that the applicant has submitted additional greenhouse gas information. If we have any additional comments on this section we will submit them at a later time. If you have any questions regarding these comments or need additional information, please contact Eva Land at 404-562-9103.

Sincerely,



Gregg M. Worley  
Chief  
Air Permits Section