

## **Permit Summary – Construction of a New Combined-Cycle Power Plant By Live Oaks Company in Sterling , GA**

### Project Description

Construct and operate a combustion turbine combined-cycle power plant. The project will generate approximately 600 megawatts (MW) of power. The single power block will be fired exclusively with natural gas, and will consist of two combustion turbines, each with a nominal power output of 200 MW; two heat recovery steam generators (HRSGs) with supplemental firing; and one steam turbine with a nominal output of 200 MW.

### Relevant PSD/BACT Permit Conditions

#### A. Overall Emission Limits (each combustion turbine and its paired duct burner)

NO<sub>x</sub> – 87 tons during any 12-month period

CO – 208 tons during any 12-month period

#### B. Authorized Fuels

Only pipeline quality natural gas shall be fired in each combustion turbine and its paired duct burner, and the sulfur content of the natural gas shall not exceed 0.5 gr/100 scf. This is BACT for PM<sub>10</sub> and SO<sub>2</sub>.

Only pipeline quality natural gas shall be fired in the in the fuel heater, and the sulfur content of the natural gas shall not exceed 0.5 gr/100 scf.

Only ultra low sulfur diesel fuel shall be fired in the emergency generator and the firewater pump.

#### C. Technology Requirements

Dry low NO<sub>x</sub> combustors and Selective Catalytic Reduction on each combustion turbine and its paired duct burner (BACT for NO<sub>x</sub>).

Catalytic oxidation on each combustion turbine and its paired duct burner (BACT for CO and VOC).

#### D. Emission Limits

<b>Pollutant</b>	<b>Operation</b>	<b>Emission Limit</b>
NO <sub>x</sub>	Each combustion turbine and its paired duct burner	15 ppmvd 0.43 lb/MW-hr, 30-day rolling average
NO <sub>x</sub>	Each combustion turbine and its paired duct burner	2.5 ppmvd, 3-hour rolling average
SO <sub>2</sub>	Each combustion turbine and its paired duct burner	0.9 lb/MW-hr
CO	Each combustion turbine and its paired duct burner	3.2 ppmvd, 3-hour rolling average while duct burner is being fired
CO	Each combustion turbine and its paired duct burner	2.0 ppmvd, 3-hour rolling average while duct burner is not being fired
VOC	Each combustion turbine and its paired duct burner	2.0 ppmvd, 3-hour rolling average
Opacity	Each combustion turbine and its paired duct burner	Less than 40%

Initial Topics for the Applicant and Regulatory Authority to Consider for Energy Efficiency Evaluations in PSD Permit Applications for a Natural Gas Fired Combined Cycle Power Plant

A. Combustion Air Preheat

- Are opportunities available to use a waste heat stream to preheat the combustion air prior to the combustion turbines? Can the steam exhaust from the recovery steam generators be used for this purpose?
- Are any waste heat streams available from existing facilities located near the power plant?

B. Further Use of Steam from the Recovery Steam Generator

- Is there a nearby off-site use for the steam from the recovery steam generator? While this will not reduce the GHG emissions at the power plant, reduced fuel consumption could be realized at the off-site facility.
- Does the facility design incorporate an economizer on the steam boiler to recover heat for preheating the boiler water?
- Does the boiler design include a heat exchanger to recover waste heat from the boiler blowdown?

C. Continuous Excess Air Monitoring and Control

- Does the power plant design include monitoring and control of the combustion air levels, such as an oxygen monitor in the heater stack and controls on the combustion air dampers?

D. Turbine Efficiency

- Does the turbine design incorporate the highest thermal efficiency available?
- What tradeoffs have been identified if other turbine designs have been selected?

E. Combustion Chamber Design

- Does the combustion chamber incorporate the latest designs to optimize fuel burning and mixing of fuel and air?
- What combustion control options (e.g., combustion/load management software) were considered to improve thermal efficiency?

## F. Insulating Materials

- Does the boiler design incorporate refractory materials that provide the highest available insulating capacity?
- Does the plant design include the use of insulating materials around the outer shell of the boiler and exposed steam pipes?

## G. Energy Efficiency Improvements in Facility Operations

- Does the facility design incorporate high efficiency motors, fans, etc.?
- If compressed air is used at the plant, has a comprehensive maintenance plan been developed for the compressed air system?
- Does the facility design incorporate energy efficient lighting systems and automated lighting controls?
- Can alternative energy sources such as solar panels be used to supply a portion of the plant's electricity needs?
- In general, what energy conservation measures were incorporated into the plant design?