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Certified Mail  
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February 2, 2010

Ms. Trina Vielhauer.  
Department of Environmental Protection  
Bureau of Air Regulation  
2600 Blair Stone Road  
Mail Station #5510  
Tallahassee, Florida 32399-2400

RECEIVED

FEB 05 2010

BUREAU OF AIR REGULATION

Dear Ms. Vielhauer:

RE: CRIST MERCURY RESEARCH CENTER CONSTRUCTION PERMIT  
PERMIT EXTENSION REQUEST  
AIR CONSTRUCTION PERMIT NO: 0330045-011-AC

*0330045-076-AC*

Gulf Power, hereby requests an extension of the Air Construction Permit for the operation of the Crist Mercury Research Center (MRC). As you may recall, the Crist Mercury Research Center was designed and constructed in 2005 in order to develop technologies and strategies for the control of mercury emissions from coal fired combustion sources. The project has been a great success in gaining knowledge regarding the chemistry of mercury control. Gulf Power would like to extend the project for an additional 5 year period. The Crist MRC Air Construction Permit has a condition that requires the disassembly and removal of the facility by April 1, 2010. This condition was also carried over into the new Title V Permit under Condition A.60. Final Notification and Removal.

Discussions with your staff indicate that the Department is open to this request and that an extension could be incorporated into one of the projects currently under review by Department. Included in this submission are PE and Authorized Representative certifying statements regarding this request. The original emission estimates are also included for further review of the project.

Please let me know if you have any questions on our request of extension for the Crist Mercury Research Test Center.

Sincerely,

A handwritten signature in black ink that reads "Dwain Waters, Q.E.P." with a stylized flourish at the end.

G. Dwain Waters, Q.E.P.  
Special Projects and Environmental Assets Coordinator

Ms. Trina Vielhauer

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cc: Jim Vick, Gulf Power Company  
Greg Terry, Gulf Power Company  
Terry Wright, Gulf Power Company  
John Dominey, Southern Company  
April Freeman Sibley, Southern Company Services  
Gary Perko, Hopping Green & Sams, P.A.  
Rick Bradburn, FDEP – NWDistrict

# **Gulf Power Company**

## **Crist Mercury Research Center**

### **Emission Estimates**

The Crist Mercury Research Center emission estimates are based on the original plant design data assuming a 100% capacity factor which would over estimate the emissions on an annual basis:

Total Flow: 25000 acfm @ 700F (~50,000 lb/hr)

Flue gas constituents

N2	72%
CO2	13.4%
SO2	500 ppm
NOx	460 ppm
Ash	2.7 gr/wscf
H2O	11%
O2	3.5%

#### **NOX**

For NOx reductions, the SCR is will be designed to a nominal 90% reduction. This leads to a reduction of 22 lbs/hr, or 99 tons/yr.

#### **Ammonia**

Ammonia slip, estimated using 5 ppm slip from the SCR, generates 0.153 lbs/hr of ammonia from the SCR. Using TRI estimates, the total vapor phase emissions from the unit is estimated at 15 lbs/yr.

#### **Activated Carbon**

Activated carbon injection concentrations typically average around 15 lbs/mmacf for ESP injection and 1.5 lbs/mmacf for baghouse injection. However, we have seen injections as high as 30 lbs/mmacf. Because we have tested that high, we used 30 lb/mmacf as the upper estimate for activated carbon. At 30, the total activated carbon injected is 131 tons/yr. We expect virtually no increase in particulate emissions, since as a worst case the carbon will have to slip through 2 cold ESPs (ours in the research facility and Unit 5 cold side), and a baghouse.

#### **SO2**

The center will have an operational FGD that will treat approximately 1 MW of flue gas, or about 20% of the total research facility flow. In this case, the SO2 feed to the FGD is 12 lb/hr. Assuming an average of 90% control, a 45 ton/yr of SO2 reduction expected. The 45 tons/yr of SO2 should generate approximately 96 tons/yr of gypsum. Air emissions will be further reduced by the new Crist FGD scrubber system. All wastes generated by the project are managed off site.

#### **Sulfuric Acid Mist**

Sulfuric acid mist will be produced as a by product of the research center control equipment. Using TRI emission factors, annual emissions of H2SO4 is estimated to be approximately 1000 lbs per year. These emissions will be further reduced by the Crist FGD scrubber system.

#### **Particulate**

There will be no change in particulate emissions (PM or PM 2.5) from operation of the research center on Unit 5. Particulate emissions in the test stream will be controlled with 2 cold side ESPs downstream of the MRC.

GULF POWER COMPANY  
CRIST ELECTRIC GENERATING FACILITY  
Mercury Research Center  
Air Construction Permit Extension 0330045-011-AC  
02/02/2010

**Owner/Authorized Representative Statement**

*Owner/Authorized Representative Statement:*

*I, the undersigned, am the owner or authorized representative of the facility addressed in this request to extend the operations permit for the Crist Mercury Research Center. I hereby certify\*, based on information and belief formed after reasonable inquiry, that the statements made in this submission are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this submission are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in the original application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.*

*James West*  
Signature

*2/2/10*  
Date

\*Certification is applicable to the Gulf Power Company submission requesting an extension of the Crist Mercury Research Center Air Construction Permit to the Florida Department of Environmental Protection dated 02/02/2010.

GULF POWER COMPANY  
CRIST ELECTRIC GENERATING FACILITY  
Mercury Research Center  
Air Construction Permit Extension 0330045-011-AC  
02/02/2010

**Professional Engineer Certification**

*Professional Engineer Statement:*

*I, the undersigned, hereby certify, except as particularly noted herein\*, that:*

*(1) To the best of my knowledge, the information presented in the Gulf Power Company submittal to the Department of Environmental Protection are true, accurate, and complete based on my review of material provided by Gulf Power engineering and environmental staff; and*

*(2) To the best of my knowledge, any emission estimates reported or relied on in this submittal are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of air pollutants not regulated for an emissions unit, based solely upon the materials, information and calculations provided with this certification.*

Signature

Date

2-2-2010

\*Certification is applicable to the Gulf Power Company submission requesting an extension of the Crist Mercury Research Center Air Construction Permit to the Florida Department of Environmental Protection dated 02/02/2010.