

TECHNICAL EVALUATION  
AND  
PRELIMINARY DETERMINATION

Wheelabrator South Broward, Inc.  
Installation of an Activated Carbon Injection System  
South Broward Facility Units 1, 2 and 3  
Municipal Waste Combustors  
Broward County

DEP File No. 0112119-010-AC  
PSD-FL-105C



Department of Environmental Protection  
Division of Air Resources Management  
Bureau of Air Regulation

September 26, 2008

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

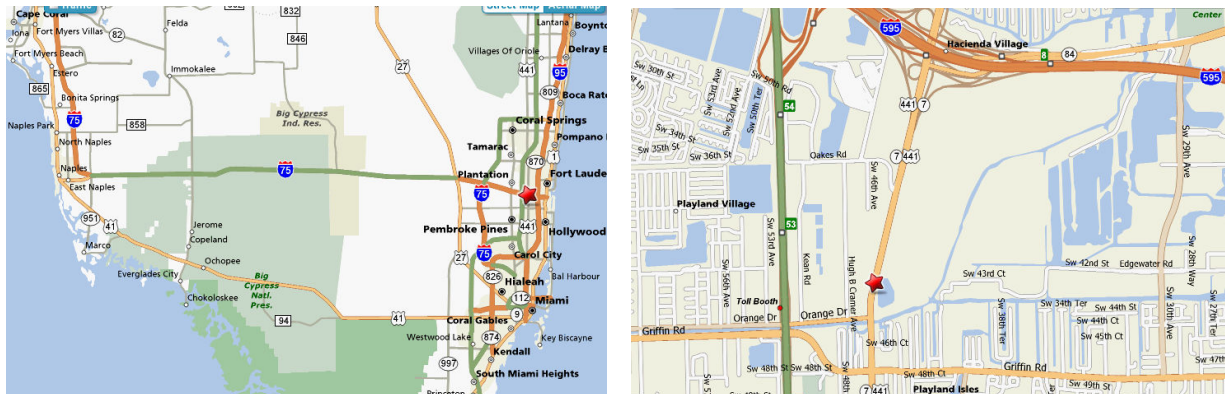
## 1. GENERAL PROJECT INFORMATION

### Facility Description and Location

The applicant, Wheelabrator South Broward, Inc. (Wheelabrator) operates the existing South Broward Waste-to Energy (WTE) Facility, which is located in Broward County at 4400 South State Road 7 in Ft. Lauderdale. The UTM coordinates are Zone 17; 579.5 kilometers (km) East and 2,883.34 km North.

The facility is comprised of three municipal waste combustors (MWC), which are categorized under Standard Industrial Classification (SIC) Code No. 4953. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to a National Ambient Air Quality Standard (NAAQS).

The following map indicates the location of the existing Wheelabrator South Broward WTE Facility.



**Wheelabrator South Broward WTE Facility location in Fort Lauderdale.**

### Facility Regulatory Categories

Title III: The existing facility is identified as a potential major source of hazardous air pollutants (HAP).

Title V: The existing facility is a Title V major source of air pollution in accordance with Chapter 213, Florida Administrative Code (F.A.C.).

Prevention of Significant Deterioration (PSD): The existing facility is a PSD-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

### Facility Description

This facility consists of three MWC with auxiliary burners, lime storage and processing facilities, ash storage and processing facilities, a cooling tower, and ancillary support equipment. Each unit has a maximum capacity of 863 tons per day (TPD) of waste input. There is a metals recovery system which is a potential source of fugitive emissions. The nominal (generator nameplate) electric generating capacity of the facility is 67.6 megawatts (MW), which is sold to the local utility.

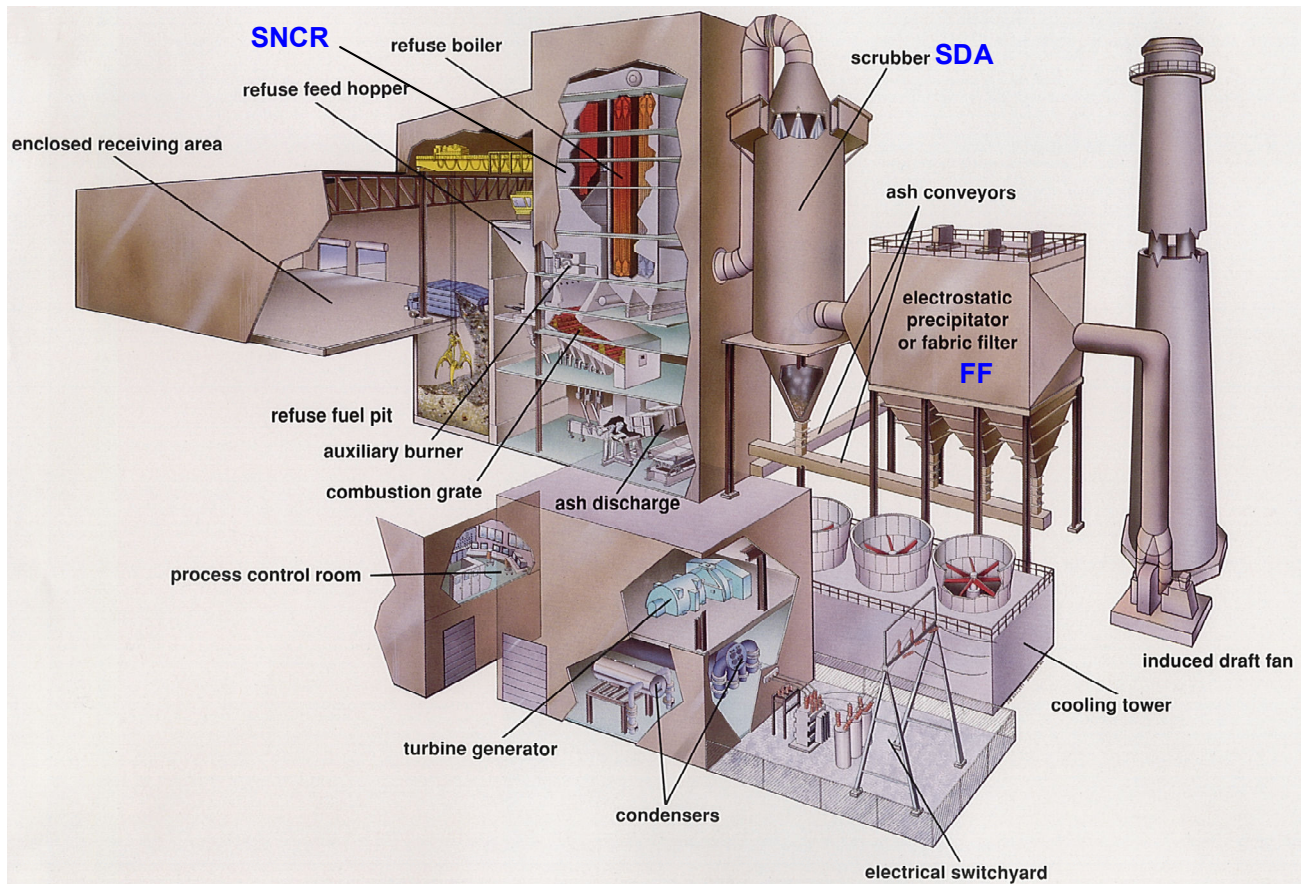
Following is a photograph of the front of the Wheelabrator South Broward WTE Facility (Source Wheelabrator) and a photograph of the rear of the nearly identical Wheelabrator North Broward WTE (Linero 1999). The three exhaust gas ducts from the boilers are visible along with the exhaust stack containing the three flues.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION



**Photographs of Wheelabrator South and North WTE Facilities.**

The following diagram is of the basic waste-to-energy process and control equipment at a typical Wheelabrator facility. Each unit includes an acid gas, air toxics, and particulate emissions control system consisting of: a urea injection system that operates on the principle of selective non-catalytic reduction (SNCR); a lime spray dryer absorber (SDA); and a fabric filter baghouse (FF).



### **Wheelabrator Mass Burn Waste-to-Energy Process including Pollution Control System.**

The three MWC are designated as Emissions Units (E.U.) Nos. 1, 2 and 3 and are listed in the following table from the most recent PSD Permit modification and Title V operation permits issued to Wheelabrator.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

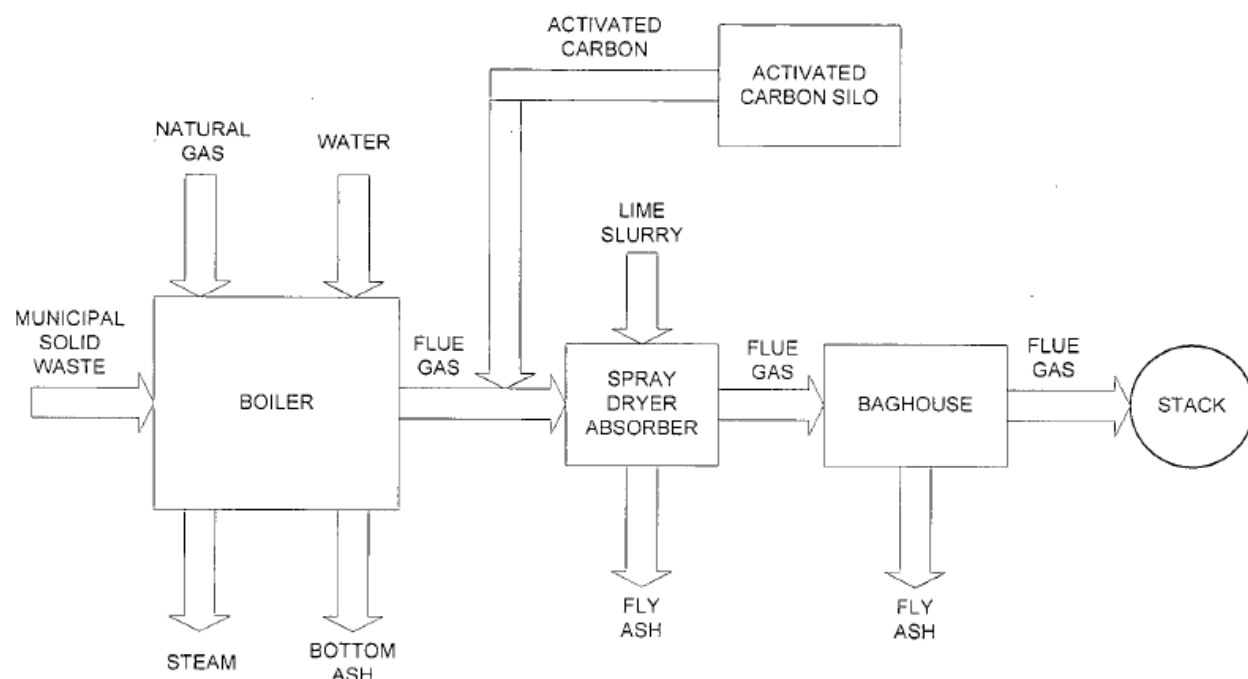
E.U. ID No.	Brief Description
001	863 TPD (maximum) Municipal Waste Combustor & Auxiliary Burners - Unit 1
002	863 TPD (maximum) Municipal Waste Combustor & Auxiliary Burners - Unit 2
003	863 TPD (maximum) Municipal Waste Combustor & Auxiliary Burners - Unit 3

### Project Description

Wheelabrator submitted an application for modification of its prevention of significant deterioration of air quality (PSD Permit) originally issued by the U.S. Environmental Protection Agency (EPA). The requested modification is to authorize the installation of an activated carbon injection (ACI) system at the facility for the purpose of reducing mercury (Hg) emissions. The system will consist of:

- One powdered activated carbon storage silo sufficient for the three boilers and with a nominal storage capacity of 3,200 cubic feet;
- One vent dust baghouse collector used during pneumatic loading of the silo from tanker truck; and
- Rotary feeders, hoppers, screw feeders and blower assemblies.

The system will inject powdered activated carbon in the flue gas at a location between the boiler and SDA on each unit as shown in the following diagram.



### Relation of ACI System to the Process at Wheelabrator South WTE Facility.

There will not be other changes to the existing system to accommodate the ACI system. The project involves no changes in the previously permitted emission, production and fuel use limitations compared with those in the Permit PSD-FL-105 and modifications thereto (PSD-105A and 105B) and the facility Title V operation permit.



## **TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION**

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The original Permit PSD-FL-105 required the SDA and FF. Permit Modification PSD-105B authorized the SNCR system. The present application for Permit Modification PSD-FL-105C is to authorize the ACI system for further Hg control. The ACI system for Hg control should also enhance dioxin/furan (D/F) control.

The facility's Title V operation permit will be updated at a future date to reflect more stringent applicable standards and the installation of the ACI system.

### **Processing Schedule**

09/11/2008 Received the application for a minor source air pollution construction permit.

09/26/2008 Department distributed draft Intent to Issue package.

## **2. APPLICABLE REGULATIONS**

### **State Regulations**

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the F.A.C. The facility is subject to the applicable rules and regulations defined in the following Chapters of the F.A.C.

<u>Chapter</u>	<u>Description</u>
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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 – Emissions Standards
62-297	Stationary Sources – Emissions Monitoring

### **Federal Regulations**

The facility was or is subject to the applicable federal provisions regarding air quality as established by the EPA in the following sections of the Code of Federal Regulations (CFR).

<u>Title 40, CFR</u>	<u>Description</u>
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Section 52.21	Prevention of Significant Deterioration of Air Quality
Part 60	Subpart A Standards of Performance for New Stationary Sources – General Provisions.
	Subpart Cb Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors that are Constructed Before September 20, 1994.

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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## General PSD Applicability

The Department regulates major air pollution sources in accordance with Florida's PSD program, as approved by the EPA in Florida's State Implementation Plan and defined in Rule 62-212.400, F.A.C. A PSD review is required in areas currently in attainment with the state and federal Ambient Air Quality Standards (AAQS) or areas designated as "unclassifiable" for a given pollutant. A new facility is considered "major" 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 28 PSD Major Facility Categories as defined in 62-210.200, F.A.C., or
- 5 tons per year of lead.

For new projects at PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the "Significant Emission Rates" listed in definitions at Rule 62-210.200, F.A.C. Pollutant emissions from the project exceeding these rates are considered "significant" and the applicant must employ the Best Available Control Technology (BACT) to minimize emissions of each such pollutant and evaluate the air quality impacts. Although a facility 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.

## Permitting Requirements and PSD Applicability for ACI Project

A PSD permit with a BACT determination was issued in 1987 by EPA for the Wheelabrator South Broward WTE Facility. Subsequent modifications were made by the Department to that permit primarily to clarify the fuel slate and to reflect more stringent standards and controls required following promulgation by EPA of 40 CFR 60, Subpart.

The project is subject to Section 62-210.300(1)(a), F.A.C., which states:

- (a) Unless exempt from permitting pursuant to paragraph 62-210.300(3)(a) or (b), F.A.C., or Rule 62-4.040, F.A.C., an air construction permit shall be obtained by the owner or operator of any proposed new, reconstructed, or modified facility or emissions unit, **or any new pollution control equipment** prior to the beginning of construction, reconstruction pursuant to 40 CFR 60.15 or 63.2, or modification of the facility or emissions unit or addition of the air pollution control equipment; or to establish a PAL; in accordance with all applicable provisions of this chapter, Chapter 62-212, F.A.C., and Chapter 62-4, F.A.C.*

Therefore, an air construction permit is required and the Department will process the application as a modification to the original authority to construct, i.e. Permit PSD-FL-105.

No changes in permitted emissions, production or fuel use limitations for the three units are requested in the present modification request. There will be emissions less than 1 ton per year from the vent dust baghouse collector used during pneumatic loading of the silo from tanker truck. Therefore, the project constitutes a modification that on its own would be exempt from permitting but for the fact that it involves the installation of control equipment on the three units.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

The key definition of “major source modification” is given at Rule 62-210.200 (192), F.A.C. as follows:

*(a) Any physical change in or change in the method of operation of a major stationary source that would result in a significant emissions increase of a PSD pollutant and a significant net emissions increase of that pollutant from the major stationary source.*

Besides the minimal emissions from the vent baghouse, there will be no emission increases and likely some emission decreases from Units 1, 2 and 3 caused by the project. Therefore, the project will not result in a significant net emission increase of a PSD pollutant and will not trigger a new PSD review and BACT determination.

### 3. EMISSIONS STANDARDS

#### Brief Discussion of Emissions

Per the most recent revision of Subpart Cb, the present federal Hg emission standards applicable to emissions from the facility are 80 micrograms per dry standard cubic meter ( $\mu\text{g}/\text{dscm}$ ) corrected to 7 percent oxygen or reduction of the potential Hg emission concentration by 85 percent (%) by weight, whichever is less stringent.

The State of Florida standards at Section 62-296.416(3)(a)1., F.A.C. are 70  $\mu\text{g}/\text{dscm}$  or 80% reduction. The facility is required by April 28, 2009 to meet the latest revision of Subpart Cb which will limit Hg emissions to 50  $\mu\text{g}/\text{dscm}$  or 85%.

The reported emission concentrations from the three units in  $\mu\text{g}/\text{dscm}$  over the past few years are given in the table below from stack tests that are done quarterly on alternating emissions units. Values greater than 50  $\mu\text{g}/\text{dscm}$  are highlighted.

Year/Unit	Unit 1	Unit 2	Unit 3
2001	11, 20	15, 22	12, 57
2002	17, 20	13, 43	43, 14
2003	<u>69</u> , 17	22, 17	34, 29
2004	21, 9	32, 13	8, 12
2005	30, 14, <u>83</u>	7, 20	8, 13
2006	14	4, <u>55</u>	17, 40
2007	13, 18	14, 15	18, 8
2008	16	14	5

Based on a strictly statistical analysis, there is a probability that without additional controls emissions of Hg in the future will at times exceed 50  $\mu\text{g}/\text{dscm}$ . Even though the facility could for some of the exceedances rely on the alternative value of 85% Hg removal, the most prudent option is to install additional Hg control capability. This will minimize the probability of exceeding the concentration standard and the removal standard.

Taken over the past ten years, emissions of Hg from the facility have been on the order of 150 pounds per year. This is much less than allowed when the facility was built, but comparable to some of the highest emitters in the state when considering other WTE facilities, cement plants and coal-fueled power plants. The ACI system will substantially reduce the emissions from the

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## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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plant to concentration well below the newly established concentration limits and will decrease the loading of Hg into the South Florida environment.

### 4. DRAFT PERMIT REQUIREMENTS

The only permit requirement for the ACI system involves language changes to the PSD Permit that:

- Authorize the installation of the ACI equipment; and
- Amend the provisions of the PSD Permit related to air pollution control equipment to reflect the installation of the ACI system.

This will allow construction to begin at the earliest date. The new limits pursuant to Subpart Cb will be incorporated by a revision to the facility's Title V operation permit, for which Wheelabrator has already applied.

The conditions are in the enclosed draft PSD permit modification and will include the following provisions:

1. Installation of Powdered Activated Carbon Injection (ACI) System: The permittee shall install a system to inject powdered activated carbon in the flue gas from the boiler at a location prior to the acid gas control device (SDA) to provide further control of mercury consisting of:
  - a. One powdered activated carbon storage silo sufficient for the three boilers and with a nominal storage capacity of 3,200 cubic feet;
  - b. One vent dust baghouse collector used during pneumatic loading of the silo from tanker truck; and
  - c. Rotary feeders, hoppers, screw feeders and blower assemblies.
2. Modification of PSD Permit: Permit PSD-FL-105, Condition 8, Air Pollution Control Equipment, is hereby modified by the addition of the following provision:
  - c. The facility shall be equipped with an ACI system as described above to provide additional control of mercury emissions from each boiler.

### 5. 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. Alvaro Linero is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.