



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

DEPARTMENT OF
ENVIRONMENTAL PROTECTION

MAY 26 2006

SITING COORDINATION
Colleen M. Castille
Secretary

May 24, 2006

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Barry M. Boldissar, Director
Hillsborough County Department of Solid Waste Management
601 East Kennedy Boulevard
Tampa, Florida 33602

Re: Hillsborough County Resource Recovery Facility
DEP File No. 0570261-007-AC (PSD-FL-369, PA82-19A)
Nominal 600 TPD Municipal Waste Combustor Unit No. 4

Dear Mr. Boldissar:

Enclosed are documents indicating the Department's intent to issue a permit pursuant to the rules for the Prevention of Significant Deterioration of Air Quality (PSD) to Hillsborough County for construction of a nominal 600 tons per day municipal waste combustor at the Hillsborough County Resource Recovery Facility. The documents include: the "Intent to Issue PSD Permit;" the "Public Notice of Intent to Issue PSD Permit;" the Department's "Technical Evaluation and Preliminary Determination" including a draft determination of Best Available Control Technology; and the Draft Permit.

The Public Notice must be published one time only as soon as possible in a newspaper of general circulation in the area affected, pursuant to Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within seven (7) days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

Please submit any other written comments you wish to have considered concerning the Department's proposed action to Mr. A. A. Linero, Program Administrator, South Permitting at the above letterhead address. If you have any questions, please call Scott Sheplak at 850/921-9532 or Mr. Linero at 850/921-9523.

Sincerely,

Trina L. Vielhauer, Chief,
Bureau of Air Regulation

TLV/aal

Enclosures

"More Protection, Less Process"

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In the Matter of an
Application for Permit by:

Hillsborough County
Department of Solid Waste Management
601 East Kennedy Boulevard
Tampa, Florida 33602

DEP File No. 0570261-007-AC
Draft Permit No. PSD-FL-369 (PA83-19A)
Hillsborough County
Resource Recovery Facility - Unit 4
Nominal 600 TPD Municipal Waste Combustor

Authorized Representative:
Mr. Barry M. Boldissar, Director

INTENT TO ISSUE PSD PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit pursuant to the rules for the Prevention of Significant Deterioration of Air Quality (PSD), copy of DRAFT Permit attached, for the proposed project as detailed in the application specified above and the attached Technical Evaluation and Preliminary Determination for the reasons stated below.

The applicant, Hillsborough County, applied on November 21, 2005 (deemed sufficient on March 31, 2006) to the Department for a PSD permit for a nominal 600 tons per day municipal waste combustor (Unit 4) at the Hillsborough County Resource Recovery Facility located at 350 North Falkenburg Road in Tampa, Hillsborough County.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that a PSD permit is required.

The Department intends to issue this air construction permit based on the belief that reasonable assurances have been provided to indicate that operation of these emission units will not adversely impact air quality, and the emission units will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C.

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed Public Notice of Intent to Issue PSD Permit. The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

The Department will issue the final permit with the attached conditions unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions.

The Department will accept written comments and requests for public meetings concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of the enclosed Public Notice. Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

This PSD permitting action is being coordinated with a certification under the Power Plant Siting Act (Sections 403.501-518, F.S.). If a petition for an administrative hearing on the Department's Intent to Issue is filed by a substantially affected person, that hearing shall be consolidated with the certification hearing (if one is held), as provided under Section 403.507(3).

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each

rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

Executed in Tallahassee, Florida.



Trina L. Vielhauer, Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

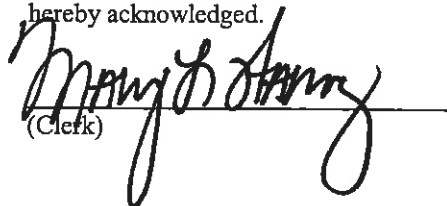
The undersigned duly designated deputy agency clerk hereby certifies that this Intent to Issue Air Construction Permit (including the Public Notice, Technical Evaluation and Preliminary Determination, and the DRAFT permit) was sent by certified mail (*) and copies were mailed by U.S. Mail or by electronic mail before the close of business on 5/25/06 to the persons listed:

Barry M. Boldissar, Hillsborough County DSWM**
Jim Norman, Chair, Hillsborough County BOCC*
Pam Iorio, Mayor, City of Tampa
Gregg Worley, U.S. EPA Region 4, Atlanta GA
John Bunyak, National Park Service, Denver CO
Steven L. Palmer, DEP Siting Office

Mara Nasca, DEP SWD
Paul Darst, Department of Community Affairs
Jerry Campbell, Hillsborough County EPC
Jason Gorrie, P.E., CDM
Glenn Hoag, Covanta Hillsborough, Inc.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.



(Clerk)

5/25/06
(Date)

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Hillsborough County Resource Recovery Facility Unit 4

DEP File No. 0570261-007-AC (PSD-FL-369, PA83-19A)

The Department of Environmental Protection (Department) gives notice of its intent to issue a permit under the requirements for the Prevention of Significant Deterioration (PSD) of Air Quality to Hillsborough County. The permit is one of several authorizations needed to construct a nominal 600 tons per day (TPD) municipal waste combustor (MWC) at the existing Hillsborough County Resource Recovery Facility southeast of Tampa, west of I-75 and near Brandon. A PSD applicability analysis and a determination of Best Available Control Technology (BACT) were required pursuant to Rule 62-212.400(2)(a) and 10(b), Florida Administrative Code (FAC) for emissions of nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), MWC acid gases, and MWC organics. The applicant's address is Hillsborough County Department of Solid Waste Management, 601 East Kennedy Boulevard, Tampa, Florida 33602.

The applicant proposes to construct a new MWC Unit 4. The primary components are: a new nominal 600 TPD MWC; a new nominal 17 megawatt (MW) steam turbine-electrical generator; expansion of the ash handling and refuse building; a new transformer yard; a new lime silo; and a new settling basin. When the project is completed, the facility will be able to process approximately 1,800 TPD of solid waste and generate approximately 47 MW (net) of electricity.

The general area is in attainment with respect to all State and National Ambient Air Quality Standards. There have been approximately 200,000 tons per year (TPY) of SO₂ and NO_x reductions since 1998 from stationary sources in the Tampa Bay area due to the natural gas repowering of the coal-fired TECO Gannon (Bayside) Station and addition of a scrubber and Low NO_x burners at the TECO Big Bend Station. Dispersion modeling indicates that the proposed project will not cause or contribute to a violation of the ambient air quality standards or allowable increases (increments). All of the modeled ground-level pollutant impacts are less than the respective significant impact levels that would otherwise require applications of more involved multiple-source dispersion models.

The proposed project is subject to 40CFR60, Subpart Eb-Standards of Performance for New Stationary Sources and Emission Guidelines (including hazardous air pollutants) for Existing Sources Municipal Waste Combustors as revised and published by the Environmental Protection Agency (EPA) on May 10, 2006.

To meet the requirements of Subpart Eb and BACT, the applicant will install: a spray dryer (SD) with lime injection to absorb MWC acid gases; an activated carbon injection (ACI) system to adsorb MWC organics and mercury (Hg); a fabric filter (FF) baghouse to remove particulate matter, including absorption/adsorption reagent; a flue gas recirculation (FGR) to limit NO_x formation; and a urea-based selective non-catalytic reduction (SNCR) system to destroy NO_x. Continuous emissions monitoring systems (CEMS) are required for CO, NO_x, SO₂ and Hg are required as well as a continuous opacity monitoring system (COMS).

The Department has determined that emissions for several key pollutants, particularly those that are affected by reagent use, can be lower than required by Subpart Eb. The Department has determined that BACT for NO_x is 110 parts per million by volume, dry corrected to 7 percent oxygen (ppmvd @7% O₂) of NO_x on a 24-hour average and 90 ppmvd @7% O₂ on a 12-month average, rolled monthly. This is the most stringent BACT for NO_x issued for a large MWC in the United States.

Mercury (Hg) emissions will be limited to 28 micrograms per dry standard cubic meter (µg/dscm). Compliance will be determined in accordance with the existing procedures in 40CFR60, Subpart Eb. However, the Department has determined that by the second year of operation, reliable Hg-CEMS will be available and requires that one be installed to measure actual emissions. This instrument represents the first Hg-CEMS required on an MWC in the United States. This instrument will provide much better information on short term and long term Hg emissions and insure that annual emissions are less than the threshold requiring a BACT determination pursuant to PSD.

The following table summarizes the estimated annual emissions and pollutant concentration limits in accordance with the Department's BACT determination, Subpart Eb, or to avoid PSD. Because of the degree of control, some pollutants are emitted at levels less than the thresholds requiring emissions limits.

Pollutant	Emissions TPY	Emission Limit	Measurement Basis	Limit Basis
NO _x	210	110/90 ppmvd	24-hr/12-month CEMS	BACT
CO	113	100/80 mg/dscm	4-hr/30-day CEMS	BACT/Eb
MWC Acid Gases (SO ₂ +HCl)	84+111=195	26/25 ppmvd*	24-hr CEMS/Stack Test	BACT/Eb
MWC Metals/PM/PM ₁₀	14.6	12 mg/dscm	Stack Test	Avoid PSD
Ozone as VOC	12	NA	NA	NA
Sulfuric Acid Mist	<<7	NA	NA	NA
Fluorides (F)	<<3	NA	NA	NA
Lead (Pb)	0.17	140 µg/dscm	Stack Test	Subpart Eb
Mercury (Hg)	<0.10	28 µg/dscm*	Stack Test	Avoid PSD
Cadmium (Cd)	0.01	10 µg/dscm	Stack Test	Subpart Eb
MWC Organics (dioxin/furan)	1.6x10 ⁻⁶	13.0 ng/dscm	Stack Test	BACT/Eb
Opacity	NA	10 percent	6-minute COMS	BACT/Eb
Ammonia (NH ₃)	<15	15/10 ppmv	Stack Tests based on load	PM, Opacity

* Alternative percent (%) removal requirements apply if values exceeded. SO₂ (80%), HCl (95%), Hg (85%)

The Department will issue the FINAL Permit, in accordance with the conditions of the DRAFT Permit, unless a response received in accordance with the following procedures results in a different decision or significant change of terms or conditions. The Department will accept written comments and requests for a public meeting concerning the proposed permit issuance action for a period of 30 (thirty) days from the date of publication of this Public Notice of Intent to Issue PSD Permit. Written comments or requests for public meetings should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400 or the e-mail address provided below. Any written comments filed shall be made available for public inspection. If comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit and require, if applicable, another Public Notice.

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below. This PSD permitting action is being coordinated with a certification under the Power Plant Siting Act (Sections 403.501-518, F.S.). If a petition for an administrative hearing on the Department's Intent to Issue is filed by a substantially affected person, that hearing shall be consolidated with the certification hearing (if one is held), as provided under Section 403.507(3). Mediation is not available in this proceeding.

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

A complete project file is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Dept. of Environmental Protection Bureau of Air Regulation 111 S. Magnolia Drive, Suite 4 Tallahassee, Florida 32399-2400 Telephone: 850/488-0114 Fax: 850/921-9533	Dept. of Environmental Protection Southwest District Office 13051 North Telecom Parkway Temple Terrace, Florida 33637-0926 Telephone: 813/632-7600 Fax: 813/744-6458	Hillsborough County Environmental Protection Commission 3629 Queen Palm Drive Tampa, Florida 33619-1309 Telephone: 813/627-2600 Fax: 813-627-2660
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The complete project file includes the application, technical evaluations, Draft Permit, and the information submitted by the authorized representative, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact Scott Sheplak or Debbie Nelson of the Bureau of Air Regulation at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information. Key correspondence, draft permit and technical evaluation can be accessed by clicking on "Hillsborough County Resource Recovery Facility" under the "Waste-to-Energy" tab at the following web page: www.dep.state.fl.us/Air/permitting/construction/hillsborough.htm



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

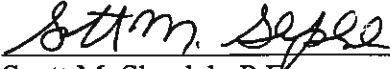
P.E. Certification Statement

Permittee:
Hillsborough County
Department Solid Waste Management
Hillsborough County Resource Recovery Facility (HCRRF)

DEP File No.: 0570261-007-AC
Permit No.: PSD-FL-369

Project Type: Air Construction Permit
600 Ton per Day (TPD) Municipal Waste Combustor - Unit 4

I HEREBY CERTIFY that the engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including but not limited to the electrical, mechanical, structural, hydrological, and geological features).

 05/24/06
Scott M. Sheplak, P.E. Date
Registration Number: 48866

Permitting Authority:
Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301
Telephone: 850/921-9532
Fax: 850/921-9533

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FACILITY DESCRIPTION

The existing facility, Hillsborough County Resource Recovery Facility (HCRRF), is located at 350 N. Falkenburg Road, Tampa, Hillsborough County.

The existing facility consists of three municipal waste combustors (MWCs), each having a nominal design rate capacity of 400 tons MSW (municipal solid waste) per day, 150 MMBtu per hour (excluding 9.9 MMBtu/hr from the combustion air preheaters) and 94,270 pounds steam per hour with MSW having a heating value of 4,500 Btu per pound.

The facility is owned by Hillsborough County and is currently operated by Covanta Hillsborough, Inc. a subsidiary of Covanta Energy Corporation. The Hillsborough County Resource Recovery Facility began operation in 1987.

PROJECT

The permittee, Hillsborough County, proposes to construct a new 600 ton per day (TPD) Municipal Waste Combustor referred to as Unit 4 at the existing facility. The nominal design rate capacity is 600 tons MSW per day, with a nominal heat input of 288 MMBtu per hour and maximum steam production of 163,780 pounds per hour. The new unit will be equipped with two natural gas-fired auxiliary burners, each with a nominal heat input of 50 MMBtu per hour. The new unit will be installed at the existing site. The flue for the new boiler is already encased in the existing stack. With the addition of the fourth unit, the existing 220 feet tall stack will contain four active flue streams. With the addition of this unit, the site capacity will increase from approximately 1,200 TPD to 1,800 TPD. The site's steam electric generating capacity will be increased from 39 MW to 47 MW (nominal).

The existing ash building and handling system will be expanded. Two new lime storage silos and a new activated carbon storage silo will be constructed for Unit 4.

Unit 4 will be a mass burn unit incorporating much of the same technology as the existing units including: combustion on a reverse-reciprocating grate system; ash discharge system; energy recovery through the furnace waterwall, superheater and economizers; electrical power production; and a pollution control system consisting of a spray dryer, fabric filter, activated carbon injection system and a selective non-catalytic reduction (SNCR). In addition the new unit will incorporate flue gas recirculation for energy efficiency and pollution reduction.

REGULATORY CLASSIFICATIONS

Section 111, Clean Air Act, Standards of Performance for New Stationary Sources (NSPS): The new unit is a large Municipal Waste Combustor (MWC) unit subject to 40CFR60, Subpart Eb - Standards of Performance for New Stationary Sources and Emission Guidelines for Municipal Waste Combustors.

Section 112, Clean Air Act, Hazardous Air Pollutants (HAPs): The facility is a major source of HAPs. The maximum achievable control technology (MACT) requirements typically specified in the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for this industry were included in 40CFR60, Subpart Eb as required by Section 169, Clean Air Act, Solid Waste Combustion.

Title IV, Acid Rain: The facility operates no units subject to the acid rain provisions of the Clean Air Act.

SECTION I. FACILITY INFORMATION (DRAFT)

Title V, Clean Air Act, Permits: The facility is a Title V or “Major Source” of air pollution because the potential emissions of at least one regulated pollutant exceed 100 tons per year or because it is a Major Source of HAPs. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), and volatile organic compounds (VOC).

Part C, Clean Air Act, Prevention of Significant Deterioration (PSD): The facility is located in an area that is designated as “attainment”, “maintenance”, or “unclassifiable” for each pollutant subject to a National Ambient Air Quality Standard. The facility is classified as a “municipal incinerator capable of charging more than 250 tons of refuse per day”, which is one of the facility categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year, therefore the facility is classified as a “Major Stationary Source” with respect to Rule 62-212.400 F.A.C.

Stationary Sources - Emission Standards in Chapter 62-296, F.A.C.: The facility operates one or more units subject to emission standards. The new Unit 4 is subject to the mercury standard in Rule 62-296.416, F.A.C. The numerical mercury emissions limit under state Rule 62-296.416, F.A.C., is more stringent than the NSPS emissions limit.

Reasonable Available Control Technology (RACT): The entire State of Florida is either classified as attainment or considered to be in attainment (i.e., unclassifiable) with respect to the NAAQS for all pollutants. However, the facility is located in a maintenance area for ozone, particulate matter and lead. The VOC and NO_x RACT provisions do not apply. The new unit has operations that are subject to PM RACT.

Siting: The facility was originally certified under PA83-19 pursuant to the power plant siting provisions of Chapter 62-17, F.A.C.

RELEVANT DOCUMENTS

- Received Site Certification and PSD application on November 21, 2005;
- Sufficiency information requested via Power Plant Siting Office on January 10, 2006;
- Supplemental information received on January 17, 2006;
- Received responses to sufficiency request on March 2, 2006;
- Siting Application found sufficient on March 31, 2006; and
- Intent to Issue PSD Permit distributed with Siting Staff Report on May 24, 2006.

GENERAL AND ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: All documents related to applications for permits to construct, modify or operate this emissions unit shall be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection (DEP), at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 and phone number 850/488-0114. Copies of these documents shall be submitted to the Compliance Authority.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications should be submitted to the compliance authority. The compliance authority is the Department's Southwest District Office at 13051 N. Telecom Parkway, Temple Terrace, FL 33637-0926.
3. General Conditions: The owner and operator are subject to, and shall operate under, the attached General Conditions listed in *Appendix GC* of this permit. General Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.); Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.); and the Title 40, Parts 51, 52, 60, 63, 72, 73, and 75 of the Code of Federal Regulations (CFR), adopted by reference in Rule 62-204.800, F.A.C. The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
5. Construction and Expiration: The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. In conjunction with an extension of the 18-month period to commence or continue construction (or to construct the project in phases), the Department may require the permittee to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for emissions units regulated by the project. For good cause, the permittee may request that this PSD air construction permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation at least sixty (60) days prior to the expiration of this permit. [Rules 62-4.070(4), 62-4.080, 62-210.300(1), and 62-212.400(6)(b), F.A.C.]
6. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
7. Source Obligation.
 - (a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the

time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.

- (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification
- (c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

[Rule 62-212.400(12), F.A.C.]

- 8. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification.

[Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

- 9. Title V Permit: This permit authorizes construction of the permitted emissions unit and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emission units. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's Bureau of Air Regulation and a copy to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

SECTION III MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

A. Common Conditions

The proposed new emissions units are:

E.U. ID No.	Emission Unit Description
-107	Nominal 288 MMBtu/hr Municipal Waste Combustor & Auxiliary Burners - Unit 4
-108	Pebble Lime Storage Silo - Unit 4
-109	Dolomitic Lime Storage Silo - Unit 4
-110	Activated Carbon Storage Silo - Unit 4
-111	Cooling Tower Cell

CONSTRUCTION ACTIVITIES

1. Unconfined Particulate Matter Emissions: Pursuant to Rules 62-296.320(4)(c)1., 3. & 4., F.A.C., reasonable precautions to prevent emissions of unconfined particulate matter include the following requirements consistent with current practices by the permittee:

All roads shall be adequately paved, and vacuum swept if appropriate, to minimize accumulations of ash and dust. The unpaved areas of the facility will be maintained and either sodded or landscaped. Hoods, fans, filters, or similar equipment will be used to contain, capture, and/or vent particulate matter. The conveyor systems of the facility will be enclosed or covered. The ash will be wetted before being stored in the ash handling building. Speed limit signs shall be posted. Unprocessed refuse storage areas which must be open for operational purposes (e.g., tipping floor or the refuse bunker while trucks are entering or leaving) shall be under negative air pressure. [Rule 62-296.320(4)(c)2., F.A.C.; and, items proposed by the applicant.]

2. General Pollutant Emission Limiting Standards. Objectionable Odor Prohibited. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

This section of the permit addresses the following emissions units.

Emissions Unit 107

Description: Emissions unit 107 consists of a nominal a nominal 600 TPD mass-burn municipal waste combustor (MWC) with two nominal 50 mmBtu/hr natural gas-fired auxiliary burners. The project will also include: a new nominal 17 megawatt (MW) steam turbine-electrical generator; expansion of the ash handling and refuse building; a new transformer yard; a new lime silo; a urea reagent storage tank; and a new settling basin. Exhaust from the new unit will be directed to a separate flue already constructed within the existing 220 foot stack.

Steam Capacity: The maximum steam production rate is 164,000 pounds of steam per hour (4-hour block average). The nominal heat input to achieve this load is approximately 288 mmBtu/hour.

Controls: Controls consist of: efficient combustion on the grate and furnace; flue gas recirculation (FGR); a spray dryer/absorber in conjunction with a fabric filter (SD/FF) for control of acid gases, particulate matter, and most metals; activated carbon injection (ACI) to enhance mercury (Hg) removal; selective non-catalytic reduction (SNCR) by ammonia or urea injection for NOx control.

Stack Parameters: The Department may require the permittee to perform additional air dispersion modeling should the actual specified stack dimensions change. The following summarizes the exhaust characteristics:

<u>Fuel</u>	<u>Heat Input Rate</u>	<u>Exhaust Temp., °F</u>	<u>Flow Rate ACFM</u>
MSW	~288 mmBtu/hour	270° F	~125,000

Continuous Monitors: The unit is equipped with continuous emissions monitoring systems (CEMS) to measure and record NOx, CO, SO2, and Hg as well as instrumentation to monitor steam flow, flue gas flow rate, oxygen, temperature, and opacity.

APPLICABLE STANDARDS AND REGULATIONS

- BACT Determinations:** The emission unit addressed in this section is subject to a Best Available Control Technology (BACT) determination for nitrogen oxides (NOx), carbon monoxide (CO), MWC acid gases (SO2+HCl); SO2 as an individual pollutant, and MWC organics (dioxin/furan). [Rule 62-212.400, F.A.C.]
- NSPS Requirements:** The municipal waste combustor and auxiliary burners shall comply with all applicable requirements of 40 CFR 60, listed below, adopted by reference in Rule 62-204.800(7)(b), F.A.C. The Department determines that the BACT emissions performance requirements are as stringent as or more stringent than the limits imposed by the applicable NSPS provisions. Some separate reporting and monitoring may be required by the individual subparts.

(a) **Subpart A, General Provisions**, including:

- 40 CFR 60.7, Notification and Record Keeping

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

- 40 CFR 60.8, Performance Tests
- 40 CFR 60.11, Compliance with Standards and Maintenance Requirements
- 40 CFR 60.12, Circumvention
- 40 CFR 60.13, Monitoring Requirements
- 40 CFR 60.19, General Notification and Reporting Requirements

(b) Subpart Eb, Standards of Performance for Large Municipal Waste Combustors

3. **Emission Standards for Stationary Sources:** This unit has a charging rate of 40 tons per day or more and is subject to the requirements of Stationary Sources – Emission Standards for Waste-To-Energy Facilities of Rule 62-296.416, F.A.C.

AIR POLLUTION CONTROL TECHNOLOGY

4. **Control Equipment:** The owner or operator shall install, operate and maintain the following air pollution control equipment consistent with the manufacturers' specifications.

NO_x Controls: A flue gas recirculation system (FGR) will be used to limit NO_x formation. A urea-based selective non-catalytic reduction (SNCR) system will be employed for the destruction of NO_x.

MWC Acid Gas Control: A spray dryer (SD) with lime injection will be installed to absorb MWC acid gases.

MWC Organics and Mercury (Hg): An activated carbon injection (ACI) system will be installed to adsorb MWC organics and mercury (Hg).

Particulate Matter (PM/PM₁₀): A fabric filter (FF) baghouse, including absorption/adsorption reagent, will be installed to remove particulate matter.

[BACT Determination, and Rules 62-4.070(1), and (3), F.A.C.]

OPERATIONAL DESCRIPTIONS AND LIMITATIONS

5. **Nameplate:** The combustor (boiler) shall have a metal name plate affixed in a conspicuous place on the shell showing the manufacturer, model number, type of waste, and rated capacity.

[Rules 62-4.160(2) and 62-210.200(PTE), F.A.C.]

6. **Hours of Operation.** This emissions unit may operate continuously, i.e., 8,760 hours/year.

[Rules 62-4.160(2) and 62-210.200(PTE), F.A.C.]

7. **Permitted Capacity.** The maximum steam production rate shall not exceed 164,000 pounds steam per hour (on a 4-hour block arithmetic average).

{Permitting Note: The nominal capacity of Unit 4 is 600 tons per day and has been determined to be greater than 250 tons per day, thus classifying the unit as a "large MWC unit" under NSPS - 40 CFR 60, Subpart Eb.}

[Rules 62-4.160(2) and 62-210.200(PTE), F.A.C., 40 CFR 60, Subpart Eb, and Design]

8. **Maximum Demonstrated Municipal Waste Combustor Unit Load.** Unit load means the steam load of the municipal waste combustor measured as specified in 40 CFR 60.58b(I)(6). Each unit shall not operate at a load level greater than 110 percent of the unit's "maximum demonstrated unit

SECTION III. PERMITS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

load.” Maximum demonstrated municipal waste combustor unit load means the highest 4-hour arithmetic average municipal waste combustor unit load achieved during four consecutive hours during the most recent dioxin/furan performance test demonstrating compliance with the applicable limit for municipal waste combustor organics. Higher loads are allowed for testing purposes as specified in 40 CFR 60.53b(b). [40 CFR 60.34b(b), 60.51b, 60.53b(b), and 60.58b(1)(6)]

9. Prohibited Fuels:

a. The facility shall not burn:

- i. those materials that are prohibited by state or federal law;
- ii. those materials that are prohibited by this permit;
- iii. lead acid batteries;
- iv. hazardous waste;
- v. nuclear waste;
- vi. radioactive waste;
- vii. sewage sludge;
- viii. explosives;
- ix. beryllium-containing waste, as defined in 40 CFR 61, Subpart C.

b. Further, the facility shall not knowingly burn:

- i. nickel-cadmium batteries pursuant to Section 403.7192 (3);
- ii. mercury containing devices and lamps pursuant to Sections 403.7186(2), and (3);
- iii. untreated biomedical waste from biomedical waste generators regulated pursuant to Chapter 64E-16, F.A.C., and from similar generators (or sources);
- iv. segregated loads of biological waste; and
- v. CCA treated wood.

10. Authorized Fuels. The primary fuel for the facility is municipal solid waste (MSW), including the items and materials that fit within the definition of MSW contained in either 40 CFR 60.51b or Section 403.706(5), Florida Statutes (1995). Subject to the limitations contained in this permit, the authorized fuels for the facility also include the other solid wastes that are not MSW which are described below:

a. Subject to the conditions and limitations contained in this permit, the following other solid waste may be used as fuel at the facility:

- i. Confidential, proprietary or special documents (including but not limited to business records, lottery tickets, event tickets, coupons and microfilm);
- ii. Contraband which is being destroyed at the request of appropriately authorized local, state or federal governmental agencies, provided that such material is not an explosive, a propellant, a hazardous waste, or otherwise prohibited at the facility. For the purposes of this section, contraband includes but is not limited to drugs, narcotics, fruits, vegetables, plants, counterfeit money, and counterfeit consumer goods;
- iii. Wood pallets, clean wood, and land clearing debris;
- iv. Packaging materials and containers;
- v. Clothing, natural and synthetic fibers, fabric remnants, and similar debris, including but not limited to aprons and gloves; or

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burner - Unit 4

- vi. Rugs, carpets, and floor coverings, but not asbestos-containing materials or polyethylene or polyurethane vinyl floor coverings.
- b. Subject to the conditions and limitations contained in this permit, waste tires may be used as fuel at the facility. The total quantity of waste tires received as segregated loads and burned at the facility shall not exceed 3%, by weight, of the facility's total fuel. Compliance with this limitation shall be determined on a calendar month basis in accordance with **Specific Condition 36** of this subsection.
- c. Subject to the conditions and limitations contained in this permit, the following other solid waste materials may be used as fuel at the facility (i.e. the following are authorized fuels that are non-MSW material). The total quantity of the following non-MSW material received as segregated loads and burned at the facility shall not exceed 5%, by weight, of the facility's total fuel. Compliance with this limitation shall be determined on a calendar month basis in accordance with **Specific Condition 36** of this subsection.
 - i. Construction and demolition debris.
 - ii. Oil spill debris from aquatic, coastal, estuarine or river environments. Such items or materials include but are not limited to rags, wipes, and absorbents.
 - iii. Items suitable for human, plant or domesticated animal use, consumption or application where the item's shelf-life has expired or the generator wishes to remove the items from the market. Such items or materials include but are not limited to off-specification or expired consumer products, pharmaceuticals, medications, health and personal care products, cosmetics, foodstuffs, nutritional supplements, returned goods, and controlled substances.
 - iv. Consumer-packaged products intended for human or domesticated animal use or application but not consumption. Such items or materials include but are not limited to carpet cleaners, household or bathroom cleaners, polishes, waxes and detergents.
 - v. Waste materials that:
 - (a) are generated in the manufacture of items in categories (iii) or (iv), above and are functionally or commercially useless (expired, rejected or spent); or
 - (b) are not yet formed or packaged for commercial distribution. Such items or materials must be substantially similar to other items or materials routinely found in MSW.
 - vi. Waste materials that contain oil from:
 - (a) the routine cleanup of industrial or commercial establishments and machinery; or
 - (b) spills of virgin or used petroleum products. Such items or materials include but are not limited to rags, wipes, and absorbents.
 - vii. Used oil and used oil filters. Used oil containing a PCB concentration equal or greater than 50 ppm shall not be burned, pursuant to the limitations of 40 CFR 761.20(e).
{Permitting note: Waste materials specifically authorized above do not require Department approval.}
 - viii. Waste materials generated by manufacturing, industrial or agricultural activities, provided that these items or materials are substantially similar to items or materials that are found routinely in MSW.

[Rule 62-4.070(1), and (3), F.A.C.]

11. Segregated Loads: The fuel may be received either as a mixture or as a single-item stream (segregated load) of discarded materials. If the facility intends to use an authorized fuel that is segregated non-MSW material, the fuel shall be either:
 - a. well mixed with MSW in the refuse pit; or
 - b. alternately charged with MSW in the hopper.
12. Combustion Practices: To ensure that the facility's fuel does not adversely affect the facility's combustion process or emissions, the facility operator shall:
 - a. comply with good combustion operating practices in accordance with 40 CFR 60.53b;
 - b. install, operate and maintain continuous emissions monitors (CEMS) for oxygen, carbon monoxide, sulfur dioxide, oxides of nitrogen and temperature in accordance with 40 CFR 60.58b; and
 - c. record and maintain the CEMS data in accordance with 40 CFR 60.59b.

These steps shall be used to ensure and verify continuous compliance with the emissions limitations in this permit.

Natural gas may be used as fuel during warm-up, startup, shutdown, and malfunction periods, and at other times when necessary and consistent with good combustion practices.

MONITORING OF OPERATIONS

13. Continuous Steam Flow Monitoring: Municipal waste combustor unit load means the steam load of the municipal waste combustor unit measured as specified in §60.58b(i)(6). The owner or operator shall install, calibrate, maintain, and operate a steam flow meter, measure steam flow in kilograms (or pounds) per hour on a continuous basis, and record the output of the monitor (in accordance with the ASME method described in 40 CFR 60.58b(i)(6)). Steam flow shall be calculated in 4-hour block arithmetic averages. Higher unit loads are allowed for testing purposes pursuant to 40 CFR 60.53b(b).
[Rules 62-204.800(8) and 62-4.070(1), and (3), F.A.C., and 40 CFR 60.53(a), and 60.58b(i)]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

EMISSIONS STANDARDS

14. Emissions from Unit 4 shall not exceed the emissions standards listed in the following table or in **Specific Conditions 15-22** and using the test methods and procedures described in **Specific Conditions 23-27**.

Pollutant	Emission Standard/Limit ¹	Lb/hour	Basis
Nitrogen Oxides (NO _x)	<u>1st year of operation:</u>		
	150 ppmvd - 24 hour block average and 110 ppmvd- 30 day rolling average	79.8 58.5	Subpart Eb Limit PTE
	<u>Thereafter:</u>		
Carbon Monoxide (CO)	110 ppmvd - 24 hour block average and 90 ppmvd - 12 month rolling average	58.5 47.9	BACT BACT
	80 ppmvd – 30-day rolling avg. 100 ppmvd - 4 hr block average	25.9 32.4	BACT BACT/Eb
Sulfur Dioxide (SO ₂)	26 ppmvd - 24 hour block average or 80% reduction ²	19.2	BACT/Eb
Hydrogen Chloride (HCl)	25 ppmvd or 95% reduction ²	25.4	BACT/Eb
Particulate Matter (PM/PM ₁₀)	12.0 mg/dscm	3.3	Avoid PSD
Lead (Pb)	140 µg/dscm	NA	Subpart Eb
Mercury (Hg)	28 µg/dscm or 85% reduction ²	0.022	Avoid PSD/Eb
Cadmium (Cd)	10 µg/dscm	NA	Subpart Eb
Dioxins/Furans ³	13.0 ng/dscm	3.61 x 10 ⁻⁶	BACT/Eb
Opacity	10 % - 6 minute average	NA	BACT/Eb
Ammonia Slip	@ 195 MMBtu/hr: 10 ppmvd @ 260 MMBtu/hr: 15 ppmvd	NA	PM, Opacity.

¹ All concentration values are corrected to 7% O₂.
 µg/dscm: Micrograms per dry standard cubic meter
 mg/dscm: Milligrams per dry standard cubic meter
 ng/dscm: Nanograms per dry standard cubic meter
 ppm: Part per million dry volume
 NA: not applicable

²Whichever standard is less stringent.

³Dioxins/ furans: Total tetra through octa-chlorinated dibenzo-p-dioxins and dibenzofurans

[40 CFR 60.44b, Rules 62-210.200, 62-210.200(BACT), 62-204.800(8), 62-4.070, F.A.C.]

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

15. Nitrogen Oxides (NO_x): During the first calendar year of operation, emissions of NO_x in the stack exhaust gas as measured by the required CEMS shall exceed neither 150 ppmvd on a 24-hr daily arithmetic average nor 79.8 lb/hr and shall exceed neither 110 ppmvd nor 58.5 lb/hr on a 30-operating day rolling average.

Thereafter, emissions of NO_x in the stack exhaust gas as measured by the required CEMS shall exceed neither 110 ppmvd nor 58.5 lb/hr on a 24-hr daily arithmetic average and shall exceed neither 90 ppmvd nor 47.9 lb/hr on a 12-month rolling average, rolled monthly.

16. Carbon Monoxide (CO): Emissions of CO in the stack exhaust gas as measured by the required CEMS shall exceed neither 100 ppmvd on a 4-hr block average nor 32.4 lb/hr and shall exceed neither 80 ppmvd nor 25.9 lb/hr on a 30-operating day rolling average.
17. Sulfur Dioxide (SO₂): Emissions of SO₂ as measured by the required CEMS shall exceed neither 26 ppmvd nor 19.2 lb/hr on a 24-hr daily geometric mean, or an emissions reduction of 80 percent shall be achieved.
18. Hydrogen Chloride (HCl): Emissions of HCl shall exceed neither 25 ppmvd nor 25.4 lb/hr or, an emissions reduction 95 percent shall be achieved as demonstrated during the required stack test.
19. Mercury Hg: Emissions of Hg shall not exceed 28 µg/dscm or an emissions reduction of 85 percent shall be achieved as demonstrated during the required annual stack test.

During the first two years of operation, emissions of Hg shall not exceed 0.022 lb/hr as measured during quarterly stack tests to provide reasonable assurance that 12-month emissions are less than the applicable PSD threshold of 200 lb/yr.

Thereafter, the owner or operator may demonstrate compliance with all Hg limits in this permit with data collected from the required Hg-CEMS as described in **Specific Condition 26**.

Otherwise, the required quarterly testing for mercury shall continue.

20. Dioxins/Furans: Emissions of dioxins/furans shall exceed neither 13.0 ng/dscm nor 3.61×10^{-6} lb/hr.
21. Particulate Matter (PM/PM₁₀): Emissions of PM shall exceed neither 12.0 mg/dscm nor 3.3 lb/hr. This will simultaneously demonstrate compliance with the PM₁₀ limits.
- {Permitting note: Compliance with this condition will also demonstrate that emissions are less than the 15 TPY PSD thresholds for PM₁₀ and MWC-Metals.}*
22. Opacity: Visible emissions shall not exceed 10 percent opacity on a 6-minute average as measured by the required continuous opacity monitoring system (COMS) and measured by an annual visible emissions test (VE).

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

TEST METHODS AND PROCEDURES

23. Test Methods: Any required stack test shall be performed in accordance with the following methods.

EPA Method	Description of Method and Comments
1 - 4	Determination of Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content. Methods shall be performed as necessary to support other methods.
5	Determination of Particulate Emissions. The minimum sample volume shall be 30 dry standard cubic feet.
6C	Determination of SO ₂ Emissions (Instrumental).
7E	Determination of NO _x Emissions (Instrumental). NO _x emissions testing shall be conducted with the air heater operating at the highest heat input possible during the test.
9	Visual Determination of Opacity
10	Measurement of Carbon Monoxide Emissions (Instrumental). The method shall be based on a continuous sampling train.
23	Measurement of Dioxin/Furan Emissions
26 or 26A	Determination of Hydrogen Chloride Emissions
29	Determination of Metals Emissions from Stationary Sources
CTM-027	Procedure for Collection and Analysis of Ammonia in Stationary Source <ul style="list-style-type: none"> • This is an EPA conditional test method. • The minimum detection limit shall be 1 ppm.

Method CTM-027 is published on EPA's Technology Transfer Network Web Site at "<http://www.epa.gov/ttn/emc/ctm.html>". The other methods are specified in Appendix A of 40 CFR 60, adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. Tests shall be conducted in accordance with the appropriate test method and the applicable requirements specified in this permit, and NSPS Subpart A in 40 CFR 60. [Rules 62-204.800, F.A.C.; 40 CFR 60, Appendix A]

24. Testing Requirements: Initial tests shall be conducted between 90% and 100% of permitted capacity; otherwise, this permit shall be modified to reflect the true maximum capacity as constructed. Subsequent annual tests shall be conducted between 90% and 100% of permitted capacity in accordance with the requirements of Rule 62-297.310(2), F.A.C. [Rule 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]

25. Initial Compliance Demonstration: Initial compliance stack tests shall be conducted within 60 days after achieving the maximum production rate, but not later than 180 days after the initial startup. In accordance with the test methods specified in this permit, Unit 4 exhaust stack gas shall be tested to demonstrate compliance with the emission standards for NO_x, CO, SO₂, HCl, PM/PM₁₀, lead, cadmium, Hg, dioxin/furans, and ammonia. The permittee shall provide the Compliance Authority

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burner - Unit 4

with any other initial emissions performance tests conducted to satisfy vendor guarantees. [Rule 62-297.310(7)(a) and (b), F.A.C.; 40 CFR 60.8]

26. **Subsequent Compliance Testing:** Annual compliance stack tests for NO_x, CO, SO₂, HCl, PM/PM₁₀, lead, cadmium, dioxins/furans, and ammonia shall be conducted during each federal fiscal year (October 1st to September 30th). Data collected from the reference method during the required RATA tests for CO, NO_x, and SO₂ may be used to satisfy the annual testing requirement provided the notification requirements and emission testing requirements for performance and compliance tests of this permit are satisfied.

Performance tests for Hg emissions shall be conducted on a calendar year basis to demonstrate compliance with the concentration/reduction standards. Performance tests to demonstrate compliance with the lb/hr Hg standard shall be conducted on a quarterly basis.

Following the first two years of operation, the owner or operator may demonstrate compliance with the Hg limits in this permit using the required Hg CEMS in lieu of the quarterly and annual testing requirements provided all provisions of **Specific Condition 35** and subpart 40 CFR 60.58b(n) and (o) are met. Otherwise, the required quarterly testing for mercury shall continue.

[Rules 62-297.310(7)(a) and (b), and 62-296.416, F.A.C., and 40 CFR 60.8 and 60.58b]

27. **Continuous Compliance:** The permittee shall demonstrate continuous compliance with the CO, NO_x, and SO₂ emissions standards based on data collected by the certified CEMS. The permittee shall demonstrate continuous compliance with the opacity limit based on data collected by the required COMS. [Rule 62-210.200 (BACT), F.A.C., and 40 CFR 60, Subpart Eb]

EXCESS EMISSIONS

28. **Department Regulations:** The following conditions apply only to the emissions limits given in **Specific Conditions 14-22** that were specified pursuant to BACT or to avoid PSD applicability.
- Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by the Department for longer duration. The Department authorizes three hours in any 24-hour period for this emissions unit. A malfunction means any unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner.
 - Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.
 - The permittee shall notify the Compliance Authority within one working day of discovering any emissions in excess of a CEMS standard subject to the specified averaging period. All such reasonably preventable emissions shall be included in any CEMS compliance determinations. All valid emissions data (including data collected during startup, shutdown and malfunction) shall be used to report emissions for the Annual Operating Report.

[Rule 62-210.700, F.A.C.]

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burner - Unit 4

{Permitting Note: The Excess Emissions Rule at Rule 62-210.700, F.A.C., cannot vary or supersede any requirement of an NSPS or NESHAP provision.}

29. Regulations pursuant to 40 CFR 60, Subpart Eb: The following conditions apply only to the emissions limits given in **Specific Conditions 14-22** that were specified pursuant to 40 CFR 60, Subpart Eb.
- a. *The opacity standards* set forth in 40 CFR 60 shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard. [40 CFR 60.11(c)]
 - b. *Startup, Shutdown and Malfunction*. Except as provided by 40 CFR 60.56b, the standards under 40 CFR 60, Subpart Eb, as incorporated in Rule 62-204.800(8)(b), F.A.C., apply at all times except during periods of startup, shutdown, or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence, except as provided in 40 CFR 60.58b(a)(1)(iii). During periods of startup, shutdown, or malfunction, monitoring data shall be dismissed or excluded from compliance calculations, but shall be recorded and reported in accordance with the provisions of 40 CFR 60.59b(d)(7).
 - i. The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other non-municipal solid waste fuel, and no municipal solid waste is being fed to the combustor.
 - ii. Continuous burning is the continuous, semi-continuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production. The use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate is not considered to be continuous burning.[40 CFR 60.58b(a)]
 - c. *Special Provisions for CO*: For the purpose of compliance with the carbon monoxide emission limits in 40 CFR 60.53b(a), if a loss of boiler water level control (e.g., loss of combustion air fan, induced draft fan, combustion grate bar failure) is determined to be a malfunction, the duration of the malfunction period is limited to 15 hours per occurrence. [40 CFR 60.58b(a)(1)(iii)]

CONTINUOUS MONITORING REQUIREMENTS

30. CEM Systems: The permittee shall install, calibrate, maintain, and operate continuous emission monitoring systems (CEMS) to measure and record the emissions of CO, NO_x, Hg and SO₂ from Unit 4 in a manner sufficient to demonstrate continuous compliance with the CEMS emission standards of this subsection. All continuous monitoring systems other than the Hg CEMS shall be installed and functioning within the required performance specifications by the time of the initial performance tests. The Hg CEMS shall be installed and functioning within the required performance specifications by the end of the second year of operation as specified in **Specific Condition 35**.

SECTION III. EMISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burner - Unit 4

- a. *CO Monitor*: The CO monitor shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 4 or 4A and shall comply with all requirements of 40 CFR 60.58b. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The required RATA tests shall be performed using EPA Method 10 in Appendix A of 40 CFR 60 and shall be based on a continuous sampling train. The CO monitor span values shall be set appropriately, considering the allowable methods of operation and corresponding emission standards.
 - b. *NO_x Monitor*: The NO_x monitor shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 2 and shall comply with all requirements of 40 CFR 60.58b. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F, and the Data Assessment Report of Section 7 shall be made each calendar quarter, and reported semiannually to the Compliance Authority. The required RATA tests shall be performed using EPA Method 7E in Appendix A of 40 CFR 60. The NO_x monitor span values shall be set appropriately, considering the allowable methods of operation and corresponding emission standards.
 - a. *SO₂ Monitor*. The SO₂ monitor shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 2 and shall comply with all requirements of 40 CFR 60.58b. Quality assurance procedures shall conform to the requirements of 40 CFR 60, Appendix F. The required RATA tests shall be performed using EPA Method 6C in Appendix A of 40 CFR 60. The SO₂ monitor span values shall be set appropriately, considering the expected range of emissions and corresponding emission standards.
 - b. *Diluent Monitor*. A continuous emission monitoring system for measuring the oxygen content of the flue gas at each location where carbon monoxide, sulfur dioxide, nitrogen oxides emissions are monitored shall be installed, calibrated, maintained, and operated in accordance with the requirements of 40 CFR 60.58b.
 - c. *Mercury Monitor*. A mercury monitor (Hg CEMS) shall be installed and operated as described in **Specific Condition 35** below.
31. **COMS**: A continuous opacity monitoring system (COMS) shall be installed, calibrated, operated, and maintained in exhaust stack in a manner sufficient to demonstrate continuous compliance with the opacity standard specified in this section. Opacity shall be based on a 6-minute block average computed from at least one observation (measurement) every 15 seconds. For the COMS, the 6-minute block averages shall begin at the top of each hour. The COMS shall meet the applicable requirements of 40 CFR 60.58b(c)(8).
32. **CEMS/COMS Certification and Initial Startup**: Each CEMS/COMS, other than the Hg CEMS, required by this permit shall be installed prior to startup. Within 60 calendar days of achieving the maximum production rate, but no later than 180 calendar days after initial startup, the owner or operator shall certify each CEMS/COMS. Upon certification of each CEMS/COMS, the owner or operator shall demonstrate compliance with all applicable standards as specified in this permit. The Hg CEMS shall be installed and functioning within the required performance specifications within the first two years of operation as specified in **Specific Condition 35**. [Rules 62-4.070(3),

SECTION III MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burner - Unit 4

62-210.800, 62-210.200(BACT) and 62-297.520, F.A.C.; 40 CFR 60.7(a), 60.13(b), and 60.58b, and Appendix B]

33. CEMS Data Requirements: The CEMS shall express the results in the units of the applicable standard and in accordance with 40 CFR 60 subparts A, and Eb.
- Data Exclusion*: Except for monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments, each CEMS shall monitor and record emissions during all operations including episodes of startups, shutdowns, and malfunctions. Limited amounts of CEMS emissions data (other than mercury data) recorded during some of these episodes may be excluded from the corresponding compliance demonstration subject to the provisions of **Specific Conditions 28 and 29** in this subsection. The permittee shall minimize the duration of data excluded for such episodes to the extent practicable.
 - Availability*. Monitor availability for each CEMS used to demonstrate compliance shall be 95% or greater in any calendar quarter. Monitor availability shall be reported in the quarterly excess emissions report. In the event 95% availability is not achieved, the permittee shall provide the Department with a report identifying the problems in achieving 95% availability and a plan of corrective actions that will be taken to achieve 95% availability. The permittee shall implement the reported corrective actions within the next calendar quarter. Failure to take corrective actions or continued failure to achieve the minimum monitor availability shall be violations of this permit, except as otherwise authorized by the Compliance Authority. The monitor availability requirements of this condition do not apply to the Hg CEMS for the first two years of operation of the CEM system. (This is consistent with the Hg CEMS availability requirement of subpart Eb.)
34. Continuous Flow Monitor: A continuous flow monitor shall be installed to determine the stack exhaust flow rate to be used in determining mass emission rates. The flow monitor shall be certified pursuant to 40 CFR 60, Appendix B, Performance Specification 6. [Rules 62-210.200(BACT), 62-204.800(8), and 62-4.070(1) and (3), F.A.C.]
35. Mercury Continuous Emissions Monitoring System (Hg-CEMS): Within 24 months of commencing operation, the owner or operator shall install and certify a mercury CEMS demonstrated to meet the requirements in Performance Specification 12A (PS-12A), "Specifications and Test Procedures for Total Vapor phase Mercury Continuous Monitoring Systems in Stationary Sources," or that has passed verification tests conducted under the auspices of the U.S. Environmental Protection Agency's (EPA) Environmental Technology Verification (ETV) Program. If the vendor provides to the Department verification of certification difficulties such that the CEMS cannot be certified by the certification deadline, and every reasonable effort has been made to do so, the Department shall grant a reasonable extension of time to certify the CEMS. After certification the owner or operator will begin reporting Hg mass emissions data. The owner or operator shall adhere to the calibration drift and quarterly performance evaluation procedures and ongoing data quality assurance procedures in 40 CFR Part 60, Appendix F or 40 CFR Part 75, Appendix B. The mass emissions shall be estimated based on the actual data collected no later than 10 days following the end of the month. The mercury monitoring data results shall be submitted quarterly. The CEMS shall only be used as the method of compliance if the owner or operator, at a minimum, meets the requirements of 40 CFR 60.58b(n). Prior to use of

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

the Hg-CEMS as the method to demonstrate compliance, the owner or operator shall submit written notice to the Department, and receive approval for missing data substitution and a data calculation approach plans.

[Rules 62-4.070(1) and (3), and 62-210.200(BACT), F.A.C., 40 CFR 60.58b, and, Hillsborough County Environmental Protection Commission Local Ordinance 1-3.53.1(f), *Municipal Solid Waste Incinerators* (for Hg monitoring)]

REPORTING AND RECORD KEEPING REQUIREMENTS

36. Segregated Solid Waste Record Keeping: The following records shall be made and kept to demonstrate compliance with the segregated non-MSW percentage limitations of **Specific Condition 10** of this subsection:

- a. Each segregated load of non-MSW materials, subject to the percentage weight limitations of **Specific Condition 10**, which is received for processing, shall be documented as to waste description and weight. The weight of all waste materials received for processing shall be measured using the facility truck scale and recorded.
- b. Each day the total weight of segregated tires received shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of tires shall be divided by the total weight of all waste materials received in the same calendar month, and the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 3% limitation.
- c. Each day the total weight of segregated non-MSW materials received that are subject to the 5% restriction shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of segregated non-MSW materials subject to the 5% restriction shall be divided by the total weight of all waste materials received in the same calendar month, the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 5% limitation.



37. Test Results: The owner or operator of an emissions unit for which a compliance test is required shall submit to the Compliance Authority on the results of each such test. The test report shall be filed with the Compliance Authority as soon as practical but no later than 15 days after the last sampling run of each test is completed. The test report shall provide sufficient information to demonstrate that the emissions unit is properly operated and the test procedures used to allow the Compliance Authority to determine that the waste was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the specified in Rule 62-297.310(8), F.A.C. [Rule 62-297.310(8), F.A.C.]

38. Malfunction Notifications: If temporarily unable to comply with any condition of the permit due to breakdown of equipment (malfunction) or destruction by hazard of fire, wind or by other cause, the permittee shall immediately (within one working day) notify the Compliance Authority. Notification shall include pertinent information as to the cause of the problem, and what steps are being taken to correct the problem and to prevent its recurrence, and where applicable, the owner's intent toward

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

B. Municipal Waste Combustor & Auxiliary Burners - Unit 4

reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with Department rules. If requested by the Compliance Authority, the owner or operator shall submit a quarterly written report describing the malfunction. [Rules 62-210.700(6) and 62-4.130, F.A.C.]

39. SIP Quarterly Report: Within 30 days following the end of each calendar quarter, the permittee shall submit a report to the Compliance Authority summarizing: equipment malfunctions resulting in excluded CEMS data and/or excess emissions; and the monitor availability of each CEMS. The report shall contain the information and follow the general format specified in 40 CFR 60.7(c), subpart A. [Rules 62-4.070(3), 62-4.130, and 62-210.200(BACT), F.A.C.]
40. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370, F.A.C.]

SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

C. Lime and Carbon Storage Silos

This section addresses the following emissions units.

E.U. ID No.	Brief Description
108	Pebble Lime Storage Silo - Unit 4
109	Dolomitic Lime Storage Silo - Unit 4
110	Activated Carbon Storage Silo - Unit 4

EQUIPMENT AND CONTROL TECHNOLOGY

1. **Equipment Description:** The permittee is authorized to construct one pebble lime storage silo, one dolomitic lime storage silo, and one activated carbon storage silo. Each silo will have a volume of approximately 2,900 cubic feet and will be equipped with its own fabric filter baghouse.
2. **Baghouse Controls:** Each emissions unit identified for lime and carbon storage shall be controlled by a baghouse system. Each required baghouse shall be designed, operated, and maintained to achieve a PM design specification of 0.015 gr/dscf.

PERFORMANCE REQUIREMENTS

3. **Hours of Operation.** These emission units may operate continuously (8,760 hours/year). [Rules 62-4.160(2), and 62-210.228(PTE), F.A.C.]
4. **Emissions Limits:** The following standards apply to each emissions point of this unit:
 - a. Visible emissions are limited to 5% opacity from each of the above listed emissions points controlled by a baghouse.
 - b. Fugitive emissions are limited to 10% opacity from any emissions point not controlled by a baghouse.

[Rule 62-070(3), F.A.C.]

{Note: The baghouses are designed to control PM emissions to 0.015 grains/dry standard cubic foot (gr/dscf). The 5% opacity limitation is consistent with this design and provides reasonable assurance that annual emissions of PM/PM₁₀ for all emission points in this emission unit system will be less than 0.5 TPY. }

[Rules 62-4.070(3), F.A.C.]
5. **Compliance Demonstrations:** Each emission point shall be tested to demonstrate initial compliance with the emission standards for visible emissions in accordance with EPA Method 9. The tests shall be conducted within 60 days after achieving the maximum production rate at which the unit will be operated, but not later than 180 days after the initial startup. Thereafter, compliance with the visible emission limits for each emission point shall be demonstrated during each federal fiscal year (October 1st to September 30th). [Rules 62-4.070(3), and 62-297.310(7)(a), F.A.C.]
6. **Test Methods:** Any required tests shall be performed in accordance with the following reference methods and the applicable requirements of Appendix C of this permit, and the applicable NESHAP provisions.

Method	Description of Method and Comments
9	Visual Determination of the Opacity of Emissions from Stationary Sources

C. Lime and Carbon Storage Silos

REPORTING AND RECORD KEEPING

7. **Baghouse O&M Plan:** For each baghouse the permittee shall prepare an operation and maintenance (O&M) plan to address proper operation, parametric monitoring, and a schedule for conducting periodic inspections and preventive maintenance. Baghouse inspections and maintenance activities shall be recorded in a written log. The O&M plan shall be submitted to the Compliance Authority prior to the initial compliance tests for this unit. [Rule 62-4.070(3), F.A.C.]
8. **Test Reports:** For each test conducted, the permittee shall file a test report including the information specified in Rule 62-297.310(8), F.A.C. with the compliance authority no later than 45 days after the last run of each test is completed. [Rules 62-297.310(8), F.A.C.]

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SECTION III. MISSIONS UNIT SPECIFIC CONDITIONS (DRAFT)

D. Cooling Tower

This section of the permit addresses the following new emissions unit.

ID	Emission Unit Description
111	One Cooling Tower Cell

EQUIPMENT

1. Cooling Tower: The permittee is authorized to construct one cooling tower cell with the following nominal design characteristics: a circulating water flow rate of 11,000 gpm; drift eliminators; a drift rate of no more than 0.001 percent of the circulating water flow. [Application; Design]

EMISSIONS AND PERFORMANCE REQUIREMENTS

2. Drift Rate: Within 60 days of commencing commercial operation, the permittee shall certify that the cooling tower was constructed to achieve the specified drift rate of no more than 0.001 percent of the circulating water flow rate. [Rule 62-210.200(BACT), F.A.C.]

{Permitting Note: This work practice standard is established as BACT avoidance for PM/PM₁₀ emissions from the cooling tower. Based on this design criteria, potential emissions are expected to be less than 0.5 tons of PM per year and less than 0.25 tons of PM₁₀ per year. Actual emissions are expected to be lower than these rates.}

SECTION IV. APPENDICES

APPENDIX A - NSPS SUBPART A, IDENTIFICATION OF GENERAL PROVISIONS

Emissions units subject to a New Source Performance Standard of 40 CFR 60 are also subject to the applicable requirements of Subpart A, the General Provisions, including:

- § 60.1 Applicability.
- § 60.2 Definitions.
- § 60.3 Units and abbreviations.
- § 60.4 Address.
- § 60.5 Determination of construction or modification.
- § 60.6 Review of plans.
- § 60.7 Notification and Record Keeping.
- § 60.8 Performance Tests.
- § 60.9 Availability of information.
- § 60.10 State Authority.
- § 60.11 Compliance with Standards and Maintenance Requirements.
- § 60.12 Circumvention.
- § 60.13 Monitoring Requirements.
- § 60.14 Modification.
- § 60.15 Reconstruction.
- § 60.16 Priority List.
- § 60.17 Incorporations by Reference.
- § 60.18 General Control Device Requirements.
- § 60.19 General Notification and Reporting Requirements.

Individual subparts may exempt specific equipment or processes from some or all of these requirements. The general provisions may be provided in full upon request.

SECTION IV. APPENDICES
APPENDIX BD – BACT DETERMINATION

Refer to the draft BACT proposal discussed in the initial Technical Evaluation for this project and to the Final Determination issued with the Final permit for the rationale regarding the following BACT determination.

Pollutant	Emission Standard/Limit ¹	Lb/hour	Basis
Nitrogen Oxides (NO _x)	110 ppmvd - 24 hour block average and	58.5	BACT
	90 ppmvd - 12 month rolling average	47.9	BACT
Carbon Monoxide (CO)	80 ppmvd – 30-day rolling avg.	25.9	BACT
	100 ppmvd - 4 hr block average	32.4	BACT/Eb
Sulfur Dioxide (SO ₂)	26 ppmvd - 24 hour block average or 80% reduction ²	19.2	BACT/Eb
Hydrogen Chloride (HCl) ³	25 ppmvd or 95% reduction ²	25.4	BACT/Eb
Dioxins/Furans ⁴	13.0 ng/dscm	3.61 x 10 ⁻⁶	BACT/Eb
Opacity	10 % - 6 minute average	NA	BACT/Eb

¹ All concentration values are corrected to 7% O₂.
 µg/dscm: Micrograms per dry standard cubic meter
 mg/dscm: Milligrams per dry standard cubic meter
 ng/dscm: Nanograms per dry standard cubic meter
 ppm: Part per million dry volume
 NA: not applicable

² Whichever standard is less stringent.

³ HCl is not a BACT pollutant. However, it must be limited together with SO₂ because they both comprise MWC-Acid Gases which has its own PSD threshold.

⁴ Dioxins/ furans: Total tetra through octa-chlorinated dibenzo-p-dioxins and dibenzofurans

1. **Nitrogen Oxides (NO_x):** Emissions of NO_x in the stack exhaust gas as measured by the required CEMS shall exceed neither 110 ppmvd nor 58.5 lb/hr on a 24-hr daily arithmetic average and shall exceed neither 90 ppmvd nor 47.9 lb/hr on a 12-month rolling average, rolled monthly.
2. **Carbon Monoxide (CO):** Emissions of CO in the stack exhaust gas as measured by the required CEMS shall exceed neither 100 ppmvd on a 4-hr block average nor 32.4 lb/hr and shall exceed neither 80 ppmvd nor 25.9 lb/hr on a 30-operating day rolling average.
3. **Sulfur Dioxide (SO₂):** Emissions of SO₂ as measured by the required CEMS shall exceed neither 26 ppmvd nor 19.2 lb/hr on a 24-hr daily geometric mean, or an emissions reduction of 80 percent shall be achieved.
4. **Hydrogen Chloride (HCl):** Emissions of HCl shall exceed neither 25 ppmvd nor 25.4 lb/hr or, an emissions reduction 95 percent shall be achieved as demonstrated during the required stack test.
5. **Dioxins/Furans:** Emissions of dioxins/furans shall exceed neither 13.0 ng/dscm nor 3.61 x 10⁻⁶ lb/hr.
{Permitting note: Compliance with this condition will also demonstrate that emissions are less than the 15 TPY PSD thresholds for PM₁₀ and MWC-Metals}
6. **Opacity:** Visible emissions shall not exceed 10 percent opacity on a 6-minute average as measured by the required continuous opacity monitoring system (COMS) and measured by an annual visible emissions test (VE).

[40 CFR 60.44b, Rules 62-210.200, 62-210.200(BACT), 62-204.800(8), 62-4.070, F.A.C.]

SECTION IV. APPENDICES
APPENDIX BD – BACT DETERMINATION

DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

A. A. Linero, P.E., Program Administrator _____
South Permitting Section
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

Approved By:

Trina L. Vielhauer, Chief
Bureau of Air Regulation

Joseph H. Kahn, Director
Division of Air Resources Management

Date

Date

SECTION IV. Appendices (DRAFT)

APPENDIX EB - Standards of Performance For Large Municipal Waste Combustors.

Applicability of 40CFR60, Subpart Eb- Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994 or for Which Modification or Reconstruction is Commenced After June 19, 1996.

The proposed Hillsborough County Resource Recovery Facility Unit 4 is a new Large Municipal Waste Combustor (Large MWC) because it is a waste combustion unit that is capable of combusting more than 250 tons per day (TPD) of municipal solid waste (MSW).

The rules applicable to Large MWC's are given at 40CFR60, Sections 60.50b through 60.59b. More specifically, Unit 4 is a Mass Burn Waterwall Furnace. The emission limits applicable to this category of MWC are specified by type of combustor in the relevant sections, paragraphs and tables that address individual pollutants including CO, NO_x, SO₂, HCl, PM, dioxin/furan, opacity, Cd, Hg, Pb, and various emission monitoring and operational parameters.

Subpart 40CFR60, Subpart Eb was revised on May 10, 2006 just a few days prior to preparation of the draft permit for Unit 4. The Department is revising the Subpart description normally included in this appendix to reconcile the new requirements with the previous ones. An updated and complete Appendix Eb highlighting the requirements applicable to Unit 4 will be included in the final permitting action if and when issued.

The Department has insured that Permit is at least as stringent as the requirements of the revised Subpart Eb. Particular attention has been given to the revised PM, Pb, Cd and Hg including the use of Hg-CEMS.

The previous version of 40CFR60, Subpart Eb with links to the May 10, 2006 changes is available at:

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=e62a6113b2c8fd1679806489b479eab4&rgn=div6&view=text&node=40:6.0.1.1.1.15&idno=40>

SECTION IV. Appendices (DRAFT)

Appendix - Construction Permit General Conditions

The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
 - a. Have access to and copy and records that must be kept under the conditions of the permit;
 - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
 - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
 - a. A description of and cause of non-compliance; and
 - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida

SECTION IV. Appendices (DRAFT)

Appendix - Construction Permit General Conditions

Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
 - a. Determination of Best Available Control Technology (X);
 - b. Determination of Prevention of Significant Deterioration (X);
 - c. Compliance with National Emission Standards for Hazardous Air Pollutants (); and
 - d. Compliance with New Source Performance Standards (X)
14. The permittee shall comply with the following:
 - a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
 - b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - c. Records of monitoring information shall include:
 - 1) The date, exact place, and time of sampling or measurements;
 - 2) The person responsible for performing the sampling or measurements;
 - 3) The dates analyses were performed;
 - 4) The person responsible for performing the analyses;
 - 5) The analytical techniques or methods used; and
 - 6) The results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SECTION IV. Appendices (DRAFT)

Appendix SC - Construction Permit Standard Conditions

Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at this facility.

EMISSIONS AND CONTROLS

1. **Plant Operation - Problems:** If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]
2. **Circumvention:** The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
3. **Excess Emissions Allowed:** Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]
4. **Excess Emissions Prohibited:** Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
5. **Excess Emissions - Notification:** In case of excess emissions resulting from malfunctions, the permittee shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]
6. **VOC or OS Emissions:** No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]
7. **Objectionable Odor Prohibited:** No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and 62-210.200(203), F.A.C.]
8. **General Visible Emissions:** No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20 percent opacity. [Rule 62-296.320(4)(b)1, F.A.C.]
9. **Unconfined Particulate Emissions:** During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

TESTING REQUIREMENTS

10. **Required Number of Test Runs:** For mass emission limitations, a compliance test shall consist of three complete and separate determinations of the total air pollutant emission rate through the test section of the stack or duct and three complete and separate determinations of any applicable process variables corresponding to the three distinct time periods during which the stack emission rate was measured; provided, however, that three complete and separate determinations shall not be required if the process variables are not subject to variation during a compliance test, or if three determinations are not necessary in order to calculate the unit's emission rate. The three required test runs shall be completed within one consecutive five-day period. In the event that a sample is lost or one of the three runs must be discontinued because of circumstances beyond the control of the owner or operator, and a valid third run cannot be obtained within the five-day period allowed for the test, the Secretary or his or her designee may accept the results of two complete runs as proof of compliance, provided that the arithmetic mean of the two complete runs is at least 20% below the allowable emission limiting standard. [Rule 62-297.310(1), F.A.C.]

SECTION IV. Appendices (DRAFT)

Appendix SC - Construction Permit Standard Conditions

11. Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]
12. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]
13. Test Procedures: Tests shall be conducted in accordance with all applicable requirements of Chapter 62-297, F.A.C.
 - a. Required Sampling Time: Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be thirty (30) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur.
 - b. Minimum Sample Volume. Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet.
 - c. Calibration of Sampling Equipment. Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.
[Rule 62-297.310(4), F.A.C.]
14. Determination of Process Variables
 - a. Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
 - b. Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.
[Rule 62-297.310(5), F.A.C.]
15. Sampling Facilities: The permittee shall install permanent stack sampling ports and provide sampling facilities that meet the requirements of Rule 62-297.310(6), F.A.C.
16. Test Notification: The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9, F.A.C.]
17. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]
18. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide

sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

- 1) The type, location, and designation of the emissions unit tested.
- 2) The facility at which the emissions unit is located.
- 3) The owner or operator of the emissions unit.
- 4) The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
- 5) The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
- 6) The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
- 7) A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
- 8) The date, starting time and duration of each sampling run.
- 9) The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
- 10) The number of points sampled and configuration and location of the sampling plane.
- 11) For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
- 12) The type, manufacturer and configuration of the sampling equipment used.
- 13) Data related to the required calibration of the test equipment.
- 14) Data on the identification, processing and weights of all filters used.
- 15) Data on the types and amounts of any chemical solutions used.
- 16) Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
- 17) The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
- 18) All measured and calculated data required to be determined by each applicable test procedure for each run.
- 19) The detailed calculations for one run that relate the collected data to the calculated emission rate.
- 20) The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
- 21) A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8), F.A.C.]

RECORDS AND REPORTS

19. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]
20. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

**TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION**

Hillsborough County Resource Recovery Facility
Nominal 600 Tons per Day Municipal Waste Combustor

DEP File No. 0570261-007-AC (PSD-FL-369, PA83-19A)



Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation

May 24, 2006

1. APPLICATION INFORMATION

Applicant Name and Address

Hillsborough County
 Department of Solid Waste Management
 601 East Kennedy Boulevard
 Tampa, Florida 33602

Authorized Representative:
 Barry M. Baldissar, Director

Processing Schedule

- Received Site Certification and PSD application on November 21, 2005;
- Sufficiency information requested via Power Plant Siting Office on January 10, 2006;
- Supplemental information received on January 17, 2006;
- Received responses to sufficiency request on March 2, 2006;
- Siting Application found sufficient on March 31, 2006; and
- Intent to Issue PSD Permit distributed with Siting Staff Report on May 24, 2006.

Facility Description and Location

Hillsborough County (the County) owns and operates (through Covanta Energy) the Hillsborough County Resource Recovery Facility (Hillsborough County RRF), which is located southeast of Tampa, west of I-75, and north of the Crosstown Expressway near Branford. The existing facility consists of three municipal waste combustors (MWCs), each having a nominal design rate capacity of 400 tons per day (TPD) of municipal solid waste (MSW). The location of the Hillsborough County RRF is shown in Figure 1.

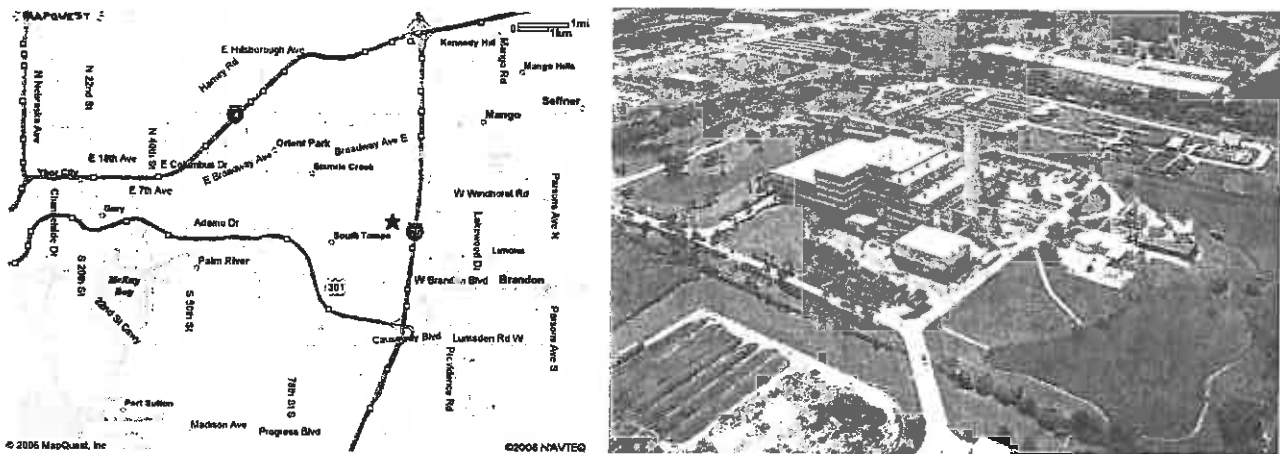


Figure 1. Location and Aerial View from Southeast of the Hillsborough County RRF

The Hillsborough County RRF is located approximately 78 kilometers south-southeast of the Chassahowitzka National Wildlife Refuge, a Class I area with respect to the rules for the Prevention of Significant Deterioration (PSD).

Regulatory Categories

Section 111, Clean Air Act, Standards of Performance for New Stationary Sources: The facility is subject to 40CFR60, Subpart Eb - Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources Municipal Waste Combustors.

Section 112, Clean Air Act, Hazardous Air Pollutants (HAP): The facility is a major source of HAP. The maximum achievable control technology (MACT) requirements typically specified in the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for this industry were included in 40CFR60, Subpart Eb as required by Section 169, Clean Air Act, Solid Waste Combustion.

Title V, Clean Air Act, Permits: The facility is a Title V or “Major Source” of air pollution because the potential emissions of at least one regulated pollutant exceed 100 tons per year or because it is a Major Source of HAPs. Regulated pollutants include pollutants such as carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter (PM/PM₁₀), sulfur dioxide (SO₂), and volatile organic compounds (VOC).

Part C, Clean Air Act, Prevention of Significant Deterioration (PSD): The facility is located in an area that is designated as “attainment”, “maintenance”, or “unclassifiable” for each pollutant subject to a National Ambient Air Quality Standard. The facility is classified as a “municipal incinerator capable of charging more than 250 tons of refuse per day”, which is one of the facility categories with the lower PSD applicability threshold of 100 tons per year. Potential emissions of at least one regulated pollutant exceed 100 tons per year, therefore the facility is classified as a “Major Stationary Source” with respect to Rule 62-212.400 F.A.C.

Siting: The facility was originally certified pursuant to the power plant siting provisions of Chapter 62-17, F.A.C.

2. PROPOSED PROJECT

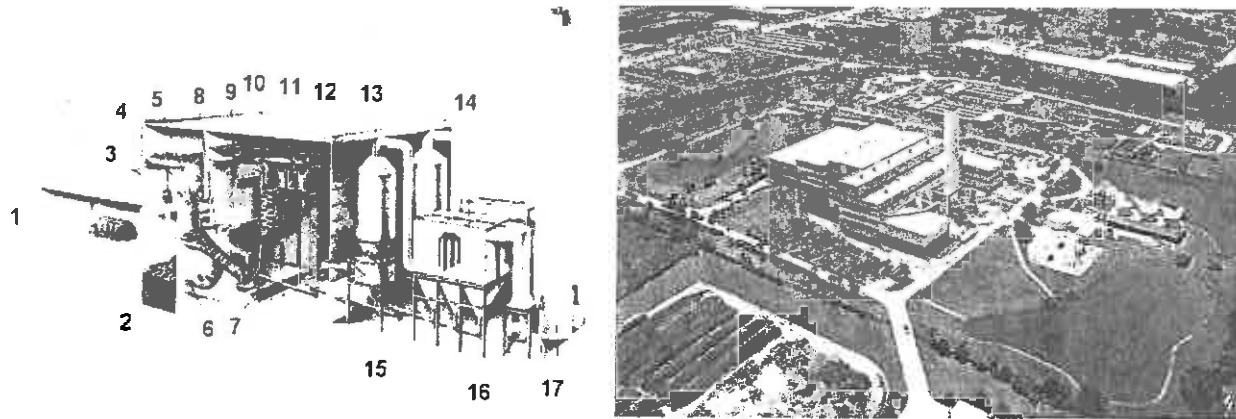
Project Description

The applicant proposes to construct a nominal 600 TPD mass-burn municipal waste combustor (MWC) with a heat input rate of 288 million Btu per hour. The project will also include: a new nominal 17 megawatt (MW) steam turbine-electrical generator; expansion of the ash handling and refuse building; a new transformer yard; a new lime silo; a urea reagent storage tank; and a new settling basin. Exhaust from the new unit will be directed to a separate flue already constructed within the existing 220 foot stack.

The existing facility is operated for the County by Covanta Energy. Covanta is a partner with Martin GmbH of Germany in MWC technology. The typical physical design of a Martin/Covanta unit is seen in the diagram on the following page. The mass burn waterwall is the most common design and is used by Covanta as well as Wheelabrator at most of the facilities they operate.

There are several approaches for pollution control. By far, the most common approach in the United States at new MWC’s is the use of a spray dryer/absorber in conjunction with a fabric filter (SD/FF) for control of acid gases, particulate matter, and most metals. This is the approach used in the typical Martin/Covanta and VonRoll/Wheelabrator designs in the United States.

Additional controls include activated carbon injection (ACI) to enhance mercury (Hg) removal and selective non-catalytic reduction (SNCR) by ammonia or urea injection for NO_x control.



- | | | |
|------------------------|---------------------------|--------------------------------------------|
| 1. Tipping Floor | 7. Martin Ash Discharger | 13. Dry Gas Scrubber |
| 2. Refuse Holding Pit | 8. Combustion Chamber | 14. Baghouse |
| 3. Grapple Feed Chute | 9. Radiant Zone (furnace) | 15. Fly Ash Handling System |
| 4. Feed Chute | 10. Convection Zone | 16. Induced Draft Air Fan |
| 5. Martin Stoker Grate | 11. Superheater | 17. Stack |
| 6. Combustion Air Fan | 12. Economizer | 18. NO _x , Hg Control Not shown |

Figure 2. Martin/Covanta Mass Burn MWC. Expanded Hillsborough County RRF

Addition of ACI and SNCR results in the well-known designs known as SD/FF/ACI/SNCR that forms the basis of the most recent revision of the HAP emissions limits for new MWC's within 40CFR60 Subpart Eb.¹ The project incorporates flue gas recirculation (FGR) to further reduce NO_x emissions.

The photograph on the right side was modified by an artist's rendition of how the facility will look when viewed from the southeast after construction of Unit 4. Basically the components of the unit shown in the left hand side of the diagram will be placed on the south side of the facility and will share the existing stack. Comparison with Figure 1 shows building extensions towards the south and on the northeast side of the facility. Also visible is a third cooling tower to the east and additional electrical switchyard equipment. By and large the facility will look much the same as it does today, despite a 50 percent increase in capacity.

Project Description

Some of the following process description is taken from a European Community publication on emissions from waste incineration, equipment descriptions from the Martin GmbH and VonRoll websites and the Department's understanding of the process.

Incineration is the destruction of solid, liquid and gaseous wastes through the application of heat within a controlled combustion system. The purpose of incineration is to reduce the volume of waste that needs land disposal and to reduce the toxicity of waste, making it more sterile. "Resource recovery" and "waste-to-energy" (WTE) are concepts that add significant value to incineration.

An RRF or WTE facility is a complete industrial installation containing most or all of the following features:

- Waste receiving and separation
- Waste storage and handling

- Waste feeding
- Furnace for combustion
- Heat recovery equipment followed by steam and electricity generation
- Air pollution control devices (flue gas treatment)
- Residue (ash and wastewater) handling installations

An animated depiction of the components of an MWC is available at the VonRoll website at: www.vonrollnova.ch/site/english/technologie/index.html by clicking on “the inner life of a plant”.

A schematic of a mass-burn MWC with steam electrical power production and air pollution control equipment is shown in the following figure. Some of the points where pollutants can be removed or formation prevented are shown. The Hg removal is not shown, but typically consists of an activated carbon injection (ACI) system and subsequent removal in the dust collector.

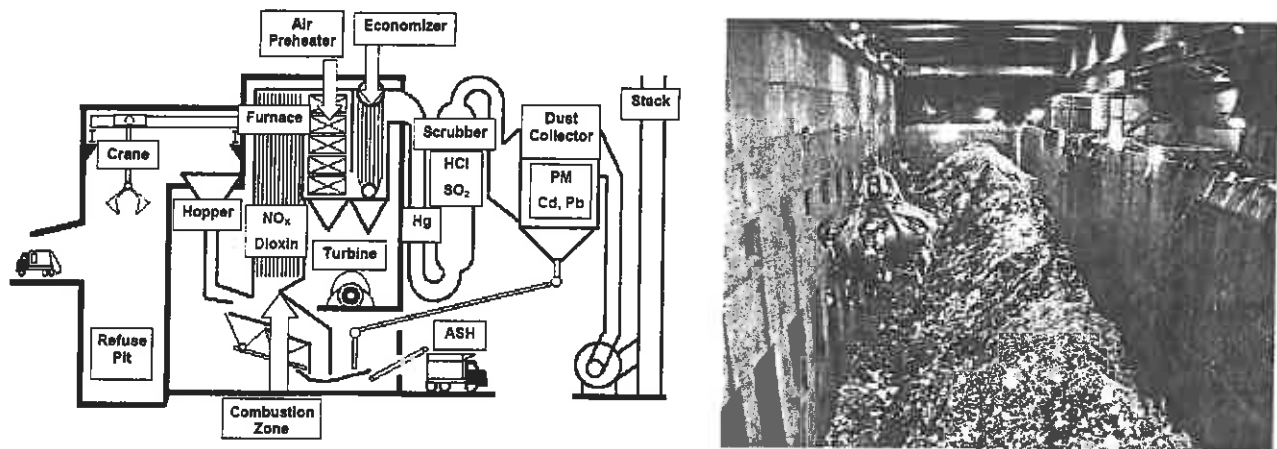


Figure 3. Schematic of a Typical Mass-burn MWC. Refuse pit at ARM Brescia facility, Italy

Waste is delivered, weighed, sorted/separated if necessary, and tipped into the refuse pit, such as the one shown above, where it is temporarily stored. The tipping hall and refuse pit are closed buildings to minimize dust and odor releases. The waste is mixed in the refuse pit which is designed to hold sufficient fuel for several days of combustion as waste is only delivered during normal hours while the plant operates “24/7”.

Air is continually extracted from the pit to maintain a negative pressure and serves as combustion air for the furnace.

A crane system lifts the waste from the refuse pit and transports it to the feed chute, which consists of a hopper and chute. Hydraulic-driven feed rams push the waste onto the horizontal combustion grate.

The grate system and furnace comprise the core of a MWC. The Martin designs can be horizontal or reverse-acting grates. Options exist regarding the manner by which the waste is mixed on the grates, number of zones, the way underfire air is introduced, overfire air arrangement, grate cooling, etc. The waste begins to burn at the grate front end and the fuel bed temperatures reach over 1,000°C. The waste is combusted to inert mineral bottom ash through the slow and uniform mixing and agitating motion of the fuel bed.

Basically the temperature is maintained high enough to destroy hazardous organic compounds such as dioxin/furan but low enough to reduce the potential for refractory damage and minimize thermal NO_x emissions. Overfire air is injected into the furnace above the fuel bed via nozzles arranged opposite each other in the front and rear furnace walls. The flue gases are thus subject to turbulence, mixed in an extremely efficient manner, and completely burn out.

Following are some of the components used in the combustion zone. Water cooled grates are available from a number of manufacturers including Martin, VonRoll, Seghers and others. They last longer than air cooled grates, allow more efficient use of primary air for combustion rather than cooling, and can aid in NO_x minimization. The heat absorbed by the water within the grates is recovered. Rows of water-cooled tiles can be added to rows of air cooled tiles in a hybrid grate arrangement based on the characteristics of the waste (i.e. high calorific value, or wet, etc.).

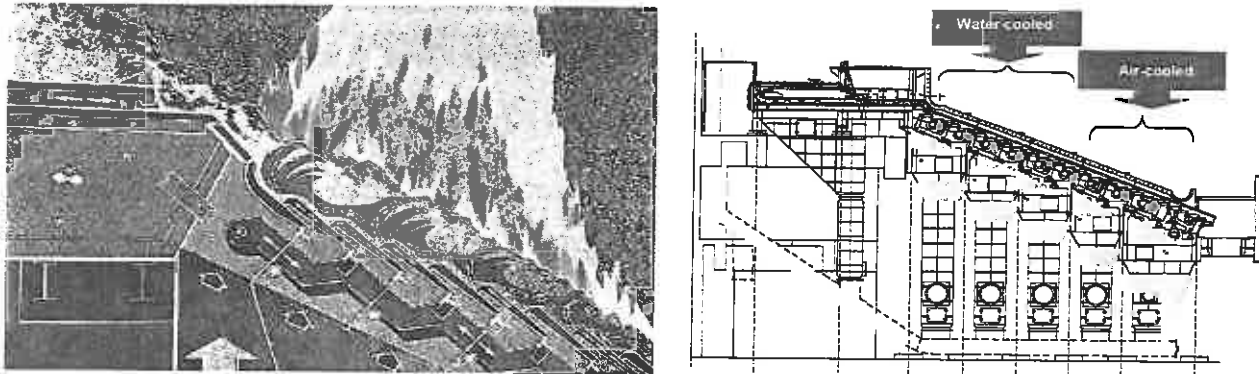


Figure 4. Martin GmbH Grate System and Seghers Hybrid Water/Air Cooled Grate System

The following figure includes a picture of the Tampa MacKay Bay RRF and a side view diagram of one of their new Riley boilers. Each boiler includes a furnace, two empty passes and several superheater and economizers in the final passes. Radiant and calorific energy released in the combustion chamber and furnace is recovered by the furnace waterwall, convective zone, superheater and economizer. The steam that is produced is used to run a steam turbine-electrical generator.

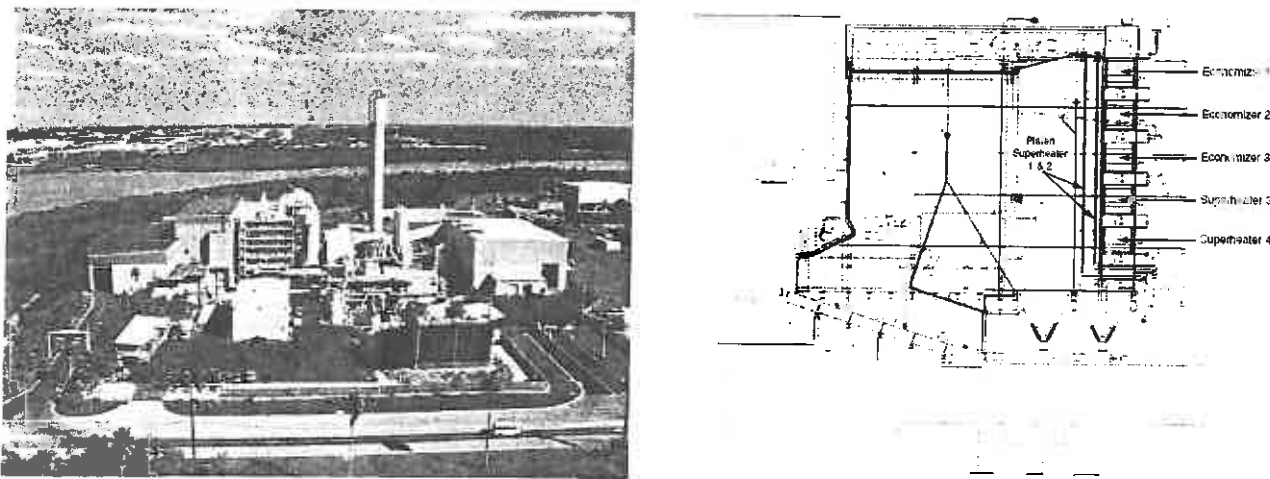


Figure 5. Aerial View, Tampa MacKay Bay RRF and Side Elevation of Riley Furnace/Boiler

In the Martin GmbH system, the hot, burned-out bottom ash is transported from the grate end to the water bath of the discharger. In the water bath, the bottom ash is completely quenched. The discharge ram pushes the bottom ash under the air sealing wall towards the drop-off edge. As a result, the bottom ash is completely quenched and is discharged in a dust-free and odorless manner. Excess water is squeezed out by the compressing action of the discharge ram. The bottom ash is moist and cool when discharged.

Most NO_x is released from combustion of fuel nitrogen, with the exception of thermal NO_x formed in "hot spots". NO_x control can be achieved within the furnace by SNCR, FGR, or other sophisticated combustion techniques.

Other pollutants released in the furnace include: Particulate matter (PM/PM₁₀) including MWC metals such as lead (Pb) and cadmium (Cd); MWC acid gases such as sulfur dioxide (SO₂) and hydrogen chloride (HCl); MWC organics including dioxin and furan; and highly volatile mercury (Hg).

The cooled flue gas leaving the economizer can be cleaned using a variety of equipment such as electrostatic precipitators (ESP's), fabric filters, spray absorbers, scrubbers, activated coke filters, and catalytic converters. The typical U.S. design uses the SD/FF combo using lime slurry instead of ESP/scrubbers. Also it incorporates activated carbon injection (ACI) instead of activated coke filter. SNCR is used instead of selective catalytic reduction (SCR) for NO_x control.

The SD/FF/ACI/SNCR design emits clean exhaust with minimal opacity and no steam plume. Subpart Eb requires use of continuous emission monitoring systems (CEMS) for CO, SO₂, NO_x, opacity, etc.

Typical Fuel Slate

The primary fuel for the unit is municipal solid waste (MSW), including the items and materials that fit within the definition of MSW contained in either 40 CFR 60.51b or Section 403.706(5), Florida Statutes (1995). Natural gas and propane are typical auxiliary fuels used during startup or to maintain stable combustion given the varying characteristics of MSW.

The County processes other solid wastes that are not strictly classified as MSW. Following is an example of a typical fuel slate for MWC's in Florida. The actual fuel slate for the proposed project will be stated in the permit.

The facility shall not burn any of the following materials:

- a) those materials that are prohibited by state or federal law;
- b) those materials that are prohibited by this permit;
- c) lead acid batteries;
- d) hazardous waste;
- e) nuclear waste;
- f) radioactive waste;
- g) sewage sludge;
- h) explosives;
- i) beryllium-containing waste, as defined in 40 CFR 61, Subpart C.

Further, the facility shall not knowingly burn:

- a) nickel-cadmium batteries pursuant to Section 403.7192 (3);
- b) mercury containing devices and lamps pursuant to Sections 403.7186(2) & (3);

- c) untreated biomedical waste from biomedical waste generators regulated pursuant to Chapter 64E-16, F.A.C., and from similar generators (or sources);
- d) segregated loads of biological waste; and
- e) CCA treated wood.

The following other solid waste may be used as fuel at the facility:

- a) confidential, proprietary or special documents (including but not limited to business records, lottery tickets, event tickets, coupons and microfilm);
- b) contraband which is being destroyed at the request of appropriately authorized local, state or federal governmental agencies, provided that such material is not an explosive, a propellant, a hazardous waste, or otherwise prohibited at the facility. For the purposes of this determination, contraband includes but is not limited to drugs, narcotics, fruits, vegetables, plants, counterfeit money, and counterfeit consumer goods;
- c) wood pallets, clean wood, and land clearing debris;
- d) packaging materials and containers;
- e) clothing, natural and synthetic fibers, fabric remnants, and similar debris, including but not limited to aprons and gloves;
- f) rugs, carpets, and floor coverings, but not asbestos-containing materials or polyethylene or polyurethane vinyl floor coverings;
- g) Construction and demolition debris.
- h) Oil spill debris from aquatic, coastal, estuarine or river environments. Such items or materials include but are not limited to rags, wipes, and absorbents.
- i) Items suitable for human, plant or domesticated animal use, consumption or application where the item's shelf-life has expired or the generator wishes to remove the items from the market. Such items or materials include but are not limited to off-specification or expired consumer products, pharmaceuticals, medications, health and personal care products, cosmetics, foodstuffs, nutritional supplements, returned goods, and controlled substances.
- j) Consumer-packaged products intended for human or domesticated animal use or application but not consumption. Such items or materials include but are not limited to carpet cleaners, household or bathroom cleaners, polishes, waxes and detergents.
- k) Waste materials that:
 - i. are generated in the manufacture of items in categories (c) or (d), above and are functionally or commercially useless (expired, rejected or spent); or
 - ii. are not yet formed or packaged for commercial distribution. Such items or materials must be substantially similar to other items or materials routinely found in MSW.
- l) Waste materials that contain oil from:
 - iii. the routine cleanup of industrial or commercial establishments and machinery; or
 - iv. spills of virgin or used petroleum products. Such items or materials include but are not limited to rags, wipes, and absorbents.
- m) Used oil and used oil filters. Used oil containing a PCB concentration equal or greater than 50 ppm shall not be burned, pursuant to the limitations of 40 CFR 761.20(e).
{Permitting note: Waste materials specifically authorized above do not require Department approval.}
- n) Waste materials generated by manufacturing, industrial or agricultural activities, provided that these items or materials are substantially similar to items or materials that are found routinely in MSW, subject to prior approval of the Department

Potential Emissions

The project will result in emissions of the pollutants listed in the following table. The applicable rules sometimes use different nomenclature for the same pollutant. Therefore, the category of MWC Metals relies on the measurement of PM (basically as a surrogate) but has a lower PSD applicable threshold. Similarly the category of MWC Acid Gases has a threshold of 40 TPY and, in addition to HCl, includes SO₂ that has its own applicable threshold of 40 TPY. PM, PM₁₀ and MWC Metals all include fine cadmium (Cd) and lead (Pb) that are also separately listed because of other applicable regulation. MWC Organics are determined by measuring dioxin and furan.

Table 1. Estimated Annual Emissions before (and after) Department Review

Pollutant	Emissions TPY	PSD Significant Emission Rate in TPY	PSD Review Required?
NO _x	256 (210)	40	Yes
CO	113	100	Yes
MWC Acid Gases (SO ₂ +HCl)	84+111=195	40 (also 40 for SO ₂ alone)	Yes
PM/PM ₁₀ /MWC Metals	25 (14.6)	25/15/15	No
Ozone as VOC	12	40	No
Sulfuric Acid Mist	74 (<<7)	7	No
Fluorides (F)	3.5 (<<3)	3	No
Lead (Pb)	0.24 (0.17)	0.6	No
Mercury (Hg)	0.17 (<0.1)	0.1	No
Cadmium (Cd)	0.02 (0.01)	Not Applicable (NA)	NA
MWC Organics (dioxin/furan)	1.6x10 ⁻⁵	3.5x10 ⁻⁶	Yes
Ammonia	43 (<15)	NA	NA

3. RULE APPLICABILITY

Local Air Rules and Ordinances - Hillsborough County Environmental Protection Commission

Chapter	Description
1-3	Stationary Air Pollution Sources and Ambient Air Quality Standards
1-3.53.1(f)	Municipal Solid Waste Incinerators (dioxin/furan; activated carbon, Hg monitoring)

Federal Regulations

This project is subject to certain applicable federal provisions regarding air quality as established by the EPA in the Code of Federal Regulations (CFR) and summarized below.

Title 40	Description
Part 52	Subpart A, as Applicable and Subpart K – State of Florida SIP Approvals
Part 60	New Source Performance Standards, in Particular 40CFR60 Subparts A and Eb
Part 70	State Operating Permit Programs

State Regulations

The 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 Florida Administrative Code (F.A.C.). This project is subject to the following rules in the Florida Administrative Code.

Chapter	Description
62-4	Permits
62-17	Electrical Power Plant Siting
62-204	Air Pollution Control – General Provisions
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Preconstruction Review (including PSD Requirements)
62-213	Operation Permits for Major Sources of Air Pollution
62-296	Stationary Sources - Emission Standards
62-297	Stationary Sources - Emissions Monitoring

Description of PSD Applicability Requirements

The Department regulates major air pollution sources in accordance with Florida’s Prevention of Significant Deterioration (PSD) program, as defined in Rule 62-212.400, F.A.C. A PSD review is only required in areas currently in attainment with the National Ambient Air Quality Standard (AAQS) for a given pollutant or areas designated as “unclassifiable” for the pollutant. A new facility is considered “major” with respect to PSD if the facility 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 facility categories listed in 62-210.200 (definitions, Major Stationary Source), F.A.C., or
- 5 tons per year of lead.

For modifications at existing PSD-major sources, each regulated pollutant is reviewed for PSD applicability based on emissions thresholds known as the Significant Emission Rates (SERs) listed in 62-210.200 (definitions, Significant Emissions Rate) F.A.C. Any pollutant emissions expected to be above the listed Significant Emission Rates are considered to be “significant” and are subject to PSD preconstruction review which includes the application of best available control technology for each PSD pollutant, and an ambient air quality impact analysis as specified in 62-212.400(8) and (10), F.A.C. Based on the initial application, BACT analysis, though not necessarily determinations, for this project were required for NO_x, CO, MWC-Acid Gases (SO₂+HCl), SO₂ as a separate pollutant, MWC-Metals, PM, PM₁₀, sulfuric acid mist (SAM), Fluorides (F), mercury (Hg), and MWC-Organics (dioxin/furan).

The other part of PSD review requires an Air Quality Analysis consisting of: an air dispersion modeling analysis to estimate the resulting ambient air pollutant concentrations; a comparison of modeled concentrations from the project with National Ambient Air Quality Standards and PSD Increments; an analysis of the air quality impacts from the proposed project upon air quality related values (AQRV’s) including soils, vegetation, wildlife, and visibility; and an air quality impacts evaluation from commercial, residential, and industrial growth related to the proposed project.

4. DRAFT DETERMINATION OF BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

4.1 BACT Determination Procedure

BACT is defined in Rule 62-210.200 (definitions), FAC as follows:

“Best Available Control Technology” or “BACT” –

- a. *An emission limitation, including a visible emissions standard, based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account:*
 1. *Energy, environmental and economic impacts, and other costs;*
 2. *All scientific, engineering, and technical material and other information available to the Department; and*
 3. *The emission limiting standards or BACT determinations of Florida and any other state; determines is achievable through application of production processes and available methods, systems and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant.*
- b. *If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of an emissions unit or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice or operation.*
- c. *Each BACT determination shall include applicable test methods or shall provide for determining compliance with the standard(s) by means which achieve equivalent results.*
- d. *In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR Parts 60, 61, and 63.*

According to Rule 62-212.400(4), FAC, the applicant must at a minimum provide certain information in the application including:

- a. *A detailed description as to what system of continuous emission reduction is planned for the source or modification, emission estimates, and any other information necessary to determine BACT including a proposed BACT.*

4.2 New Source Performance Standards

The United States Environmental Protection Agency (EPA) promulgated 40CFR60, Subpart Eb in 1995 to control emissions of the typical products of combustion such as PM/PM₁₀, NO_x, SO₂, CO that are typically the pollutants of interest in BACT determinations. Per a requirement of the Clean Air Act Amendments of 1990, Section 129 required EPA to regulate HAPs from MWCs pursuant to Section 111 and therefore under 40CFR Part 60 rather than 40CFR Part 63.

The typical requirements of 40CFR63 to set National Emission Standards for Hazardous Air Pollutants (NESHAP) and to determine maximum achievable control technology (MACT) for large MWCs are covered by 40CFR60, Subpart Eb.

EPA developed Subpart Eb relying largely on the most recent MWC units built in the U.S., with special attention to the Lee County RRF. The basis of the limits set in Eb is the previously mentioned SD/FF/ACI/SNCR configuration. On May 10, 2006 EPA issued a Final Rule that modified Subpart Eb. The revised rule is based largely on the performance of this configuration following testing of the newer units and retrofitted existing units that incorporated the mentioned strategy.

The Department notes that EPA addressed MWCs in a very comprehensive manner by addressing all pollutants of concern, describing the monitoring requirements and identifying appropriate technology. Therefore, the Department will rely on EPA's evaluations for Subpart Eb when determining BACT for many of the pollutants. There are a few exceptions where the Department's recent permitting indicates that lower emissions limits constitute BACT.

The following table contains the most recent Subpart Eb emission limit for mass-burn MWCs.

Table 2. Comparison of Applicant's Original Proposed Emission Limits with Requirements for MWC's per Subpart Eb Promulgated on May 10, 2006

Pollutant	Subpart Eb	Proposed Unit 4
Nitrogen Oxides (NO _x)	180 ppmvd (1 st year) 150 (thereafter) (24 hr mean)	110 ppmvd (24-hr mean)
Carbon Monoxide (CO)	100 ppmvd (4-hr block mean)	80 ppmvd (4-hr block mean)
Sulfur Dioxide (SO ₂)	30 ppmvd or 80% control (24-hr geometric mean)	26 ppmvd or 80% control (24-hr geometric mean)
Hydrogen Chloride (HCl)	25 ppmvd or 95% control ²	25 ppmvd or 95% control
Particulate Matter (PM)	20 mg/dscm	20.6 mg/dscm
Lead (Pb)	140 µg/dscm	200 µg/dscm
Mercury (Hg)	50 µg/dscm or 85% control ²	28 µg/dscm or 85% control ²
Cadmium (Cd)	10 µg/dscm	20 µg/dscm
Dioxin/Furan (CDD/CDF)	13 ng/dscm	13 ng/dscm

As previously mentioned, the nomenclature between the NSPS limits and the PSD pollutants is somewhat different and will be reconciled when setting limitations under the two programs.

The overall observation is that certain emission limits as originally proposed by the applicant for Unit 4 will not comply with the new Subpart Eb. However, the Department reviewed the data assessed by EPA's consultant in their proposal to revise Subpart Eb and has reasonable assurance that the SD/FF/ACI/SNCR configuration proposed by the County will readily achieve the latest emission limits per Subpart Eb.² Reference to the EPA consultant's data will be made when assessing control on several of the pollutants discussed below.

The rationale for this conclusion is that no data were excluded (as outliers) by EPA's consultant from tests conducted on the Hillsborough, Lake and Lee RRF's which are all of the Martin design with the SD/FF/ACI/SNCR configuration. All measurements reviewed by EPA's consultant from Hillsborough, Lake and Lee RRF's are already less than the new Subpart Eb. The emission limits in Subpart Eb and the technology configuration defined by SD/FF/ACI/SNCR place an effective floor on BACT and the technology to achieve it.

4.3 NO_x Formation and Control

The Department assessed industrial NO_x emission trends in Hillsborough County since 1998. Between 1998 and 2005 emissions of NO_x were reduced by approximately 40,000 tons per year from TECO's power plants.³ By comparison the proposed increase (before application of the Department's BACT analysis) from Hillsborough County Unit 4 is 256 TPY. While this point is not the key factor in a BACT determination, it does help put the issue in better perspective.

As previously discussed, NO_x formation is largely a function of fuel NO_x and the ability to control "hot spots" to avoid thermal NO_x formation. The "standard configuration" relies on SNCR, but does not address combustion techniques, catalysts, or enhancement to SNCR that have been used to achieve low emissions in several European countries.

Flue Gas Recirculation

In a MWC, more secondary air is required to provide turbulence than is needed simply for supplying oxygen. The resulting excess oxygen encourages both NO_x and dioxin formation. Flue gas recirculation (FGR) involves branching off flue gases downstream of the fabric filter and returning them to the combustion chamber to replace some of the overfire air.

FGR replaces 10-30% of secondary air (with N₂ and CO₂) reducing oxygen and peak temperatures thereby reducing NO_x generation. FGR gives around 20% NO_x reduction, but it has, in combination with repositioning air inlets (using Computational Fluid Dynamics to optimize locations) and improved control, given 25-35% reduction.

Higher re-circulation rates can cause corrosion due to elevated CO concentrations and condensation of corrosive compounds. However these potential problems as well as heat loss can be avoided by insulating the gas ducts. The thermal efficiency of the installation may be increased by the re-circulation of the already warmed flue gases. In the United Kingdom, all incineration plants are expected to include FGR or provide a clear site specific justification why FGR is not used.⁴

FGR was not considered as part of the NO_x control strategy by EPA when developing the Subpart Eb limits issued in 1995 although suppliers, such as Enercon, supplied FGR on small MWC's (<250 TPD).

Configurations with FGR, a hybrid air/water-cooled grate system, and more effective SNCR systems make it possible to reduce NO_x to levels much less than required by Subpart Eb for large MWC's in a cost-effective and energy-efficient manner.

Basic SNCR

SNCR technology involves injection of ammonia or urea at a point (or points) in the process characterized by a temperature window between 850 and 1100 °C. The following figures from Seghers and Martin GmbH depict FGR and SNCR, respectively.

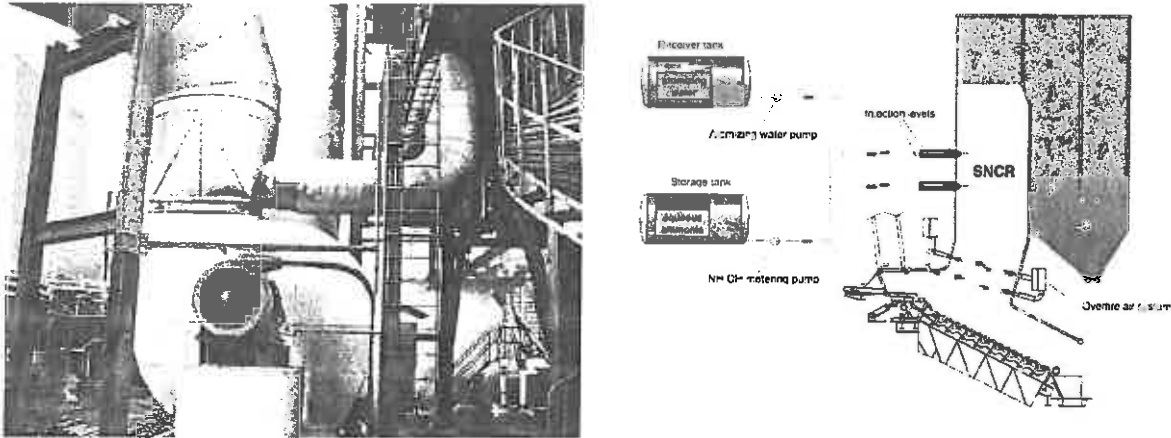
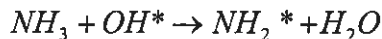


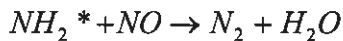
Figure 6. FGR System, Orebro, Sweden.⁵ Martin GmbH Basic Ammonia SNCR System

The precise temperature window for SNCR may vary significantly based on the specific application. Residence time, turbulence, oxygen content, and a number of other factors specific to the given gas stream are also important. SNCR destroys NO_x by a two-step process as follows:

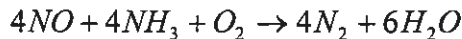
Equation 1. Ammonia reacts with available hydroxyl radicals to form amine radicals and water per the following theoretical equation:



Equation 2. Amine radicals combine with nitrogen oxides to form nitrogen and water.

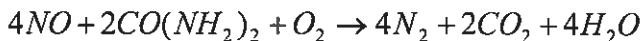


Equation 3. The two steps are typically expressed as a single “global reaction”.

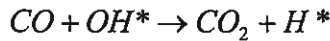


The simplified equation does not convey the kinetics. But it suggests that, theoretically, SNCR will function best in an oxidizing atmosphere.

Equation 4. The global reaction for the variation using urea is different.



Equation 5. In a reducing atmosphere, CO competes with ammonia for available OH radicals



Because of the balancing of temperature, CO, and O₂, it is important to insure good combustion and to avoid hot and cold spots when using SNCR. These are also important consideration in selecting the level (or levels) in the furnace for ammonia or urea injection.

The County plans to use the urea-based NO_xOUT process licensed by Fueltech. Reagent injection will be practiced at three levels. The following table is from the SNCR Technical Specification prepared by Burns and Roe for the County.⁶

Table 3. SNCR NO_xOUT System Process Design Table for Two Heat Input Levels

Parameter @ Maximum Heat Input	@260 mmBtu	@195 mmBtu
Uncontrolled NO _x (ppmd @7% O ₂)	350	350
Uncontrolled NO _x (lb/hr)	141	106
Percent NO _x Reduction (%)	69	69
Controlled NO _x (ppmd @7% O ₂)	110	110
Controlled NO _x (lb/hr)	44	33
NO _x Removed (lb/hr)	109	73
Expected NO _x OUT Reagent Flow (gph)	54	41
Ammonia Slip (ppm as measured)	15	10
Furnace CO (ppm)	<100	<100
Type of Furnace	Martin MSW Combustor	
Flue Gas Temperature (Degrees Fahrenheit)	1750-1950 (950-1065 °C)	
Injectors	3 Levels of 7 injectors	
Fuel fired	MSW	

Fueltech submitted a bid for a very similar specification also prepared by Burns and Roe for the Lee County RRF Unit 3 project that is presently under construction.^{7, 8} At the recommendation of the County's Solid Waste Department, Covanta Lee Inc., and Burns and Roe the bid was accepted on September 20, 2005 at a total cost of approximately \$1,081,000 FOB. The Fueltech proposal was a specific requirement by Covanta Lee to guarantee, as the operator, compliance with the NO_x standard.

The Fueltech bid includes: engineering; modeling; reagent tank; circulation module; ILC metering; three distribution modules; 21 wall injectors; furnace temperature monitor; control room interface; freight, installation support; and training/startup, all equipment, performance bond, and training.

The Bid Specification for Hillsborough RRF Unit 4 is based on a maximum uncontrolled NO_x concentration (the main basis of design) of 350 ppmvd. The final design for the Lee County RRF estimates uncontrolled NO_x emissions at 200-350 ppmvd.

An example of a Seghers NO_x strategy within the SD/FF/ACI/SNCR configuration is shown on the left hand side of the following figure.¹⁰ The design includes FGR and a hybrid water/air-cooled grate system. The values on the right hand side indicate the range of NO_x, beginning with the hybrid grate as the baseline (i.e. no FGR/SNCR) and progressively adding FGR (only 10% recirculation) and SNCR. The “typical value” is an estimate of the baseline case, without the hybrid grate system.

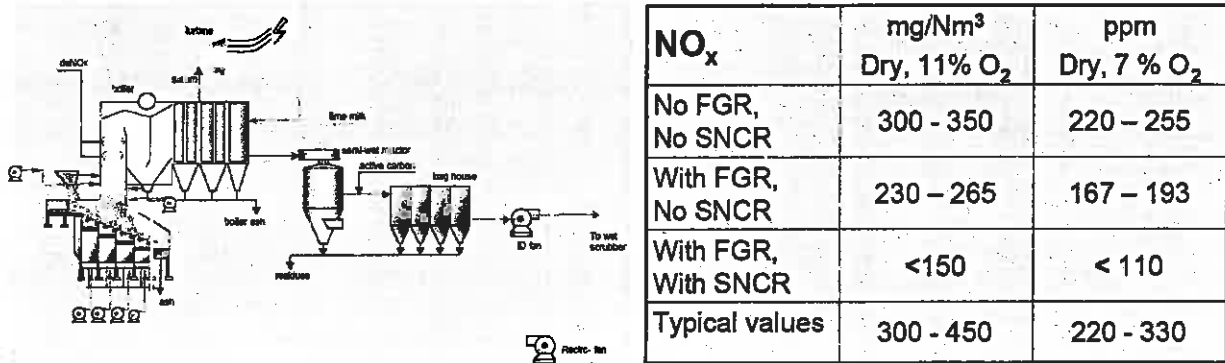


Figure 7. SD/FF/ACI/SNCR/FGR/Hybrid Grate & Results at Orebro. Startup 2003.

The values achieved at Orebro are useful in the present analysis, because they show how the baseline can be reduced prior to consideration of the benefits of SNCR. The typical range of baseline values of 220 to 330 NO_x ppmvd @7% O₂ is for all practical purposes the same as given for the nearly identical Lee and Hillsborough County RRF projects (200-350 ppmvd @7% O₂). For reference, the Orebro facility reported ammonia slip (exiting the boiler, not the final wet scrubber) of 11 ppm @7% O₂. (From this point on all ppm value presumes 7% O₂)

The main difference between the Orebro and Hillsborough RRF designs is that the former relies on the benefits of the hybrid grate system and FGR to reduce the baseline before relying on the SNCR system whereas the latter specifies an SNCR system capable of handling the entire reduction to 110 ppmvd. The County has not incorporated water-cooled grates but is including an FGR system. The County did not include the NO_x reductions of FGR in achieving 110 ppmvd. Yet, the County included the FGR costs in the cost effectiveness calculation of the FGR/SNCR strategy given in the application in Table 3-9. This overestimated the cost of SNCR control at \$2,400 ton of NO_x removed instead of the typical values on the order of \$1,000 per ton removed.

The Department estimates that the typical pre-SNCR values for the Hillsborough County RRF will be reduced by FGR to a range of 150 to 265 ppmvd. Assuming only 60% reductions by SNCR (versus 69%) and with a much lower starting point, it should be possible to achieve typical, short-term emissions to a range of 60 to 106 ppmvd. This would meet the proposed 110 ppmvd limit on a 24-hour basis and a lower value, less than 90 ppmvd on a longer basis (e.g. 30 days or 12 months, rolled monthly), without excessive ammonia emissions.

Enhanced SNCR

The Fueltech SNCR system represents what can be achieved with a good design. There are further enhancements that can allow additional reduction. These include but are not limited to:

- Excess reagent injection and tail end scrubbing to remove or recover the excess ammonia;

- Infrared camera and process controls in conjunction with the many injectors to optimize use of reagent with respect to three dimensional furnace temperature profile;
- Tunable diode laser (TDL) to identify areas of excess ammonia and adjust the injectors and total reagent usage accordingly.

An example of an SNCR system based on injection of excess reagent is described by VonRoll as follows: “Achieving high removal efficiency of NO_x requires injecting more ammonia than is consumed. The excess can be removed downstream by the flue gas scrubber. With our patented process, the ammonia is recovered from the effluent. And the process equipment takes up very little space. Experience demonstrates that the SNCR DeNO_x process is capable of removing up to 90% of the NO_x from the flue gas.”¹¹

This scenario would necessitate the use of a wet scrubber in place of SD within the previously discussed SD/FF/ACI/SNCR configuration. However it is possible to add a smaller duty scrubber to the configuration to absorb the excess ammonia when needed to achieve 90% removal. The County considered this strategy and submitted the following costs.

Table 4. Summary of Applicant’s Estimated Costs for Ammonia Scrubbing Equipment

Description	Wet Scrubber
Estimated Capital Costs	\$3,000,000
Estimated Annualize Capital (7%, 20 yrs)	\$300,000
Estimated Annualized O&M Costs	\$450,000
Total Annual Cost	\$730,000
Tons of Ammonia Removed per Year	61
Total Cost per Ton of <u>Ammonia</u> Removed	\$24,000

It does not appear that the estimate was made pursuant to a bid specification such as the SNCR package prepared by Burns & Roe for Lee and Hillsborough County. The Department does not necessarily agree with the estimate and notes that it is approximately three times the cost of the basic SNCR system.

According to the consultant, CDM, the County “has expressed concern about the resulting ammonia loading to its WWTP, which may require costly wastewater pretreatment technology to be installed. Additionally, because the ammonia scrubber relies on wet scrubbing technology, a significant vapor plume would be created.”

The cost estimate above does not take into consideration the fact that installation of such a scrubber will allow reduction of NO_x from the 60-70% range estimated by Fueltech to the 90% removal rate estimated by VonRoll. Basically a further reduction of NO_x emissions on the order of 150 tons per year can be achieved for a marginal cost-effectiveness less than \$5,000 per ton of NO_x removed while still achieving an average cost-effectiveness for NO_x control by SNCR on the order of \$2,000 per ton.

CDM used the estimate to claim a cost of \$24,000 per ton of ammonia removed. However instead of increasing the load to the wastewater treatment plant, the water can be stripped of ammonia that can, in turn, be introduced into the furnace for NO_x control via a number of paths. For example, an SNCR test program conducted at several cement plants showed that ammonia has a lower temperature window than urea. The ammonia can be returned to the process at a place in the furnace where the temperature is somewhat cooler.

A number of “smart systems” have been described that used in conjunction with SNCR and FGR can improve efficiency and reduce ammonia emissions that the County believes are possible when attempting to achieve low emission values. An early version of such a system is used at the Brescia Termoutilizzatore in Italy. The unit has the same “Martin” configuration (SD/FF/ACI/SNCR plus 30% FGR) planned for Hillsborough. In addition an expert system with infrared camera control was included.

The project was authorized in 1993 with a requirement to achieve 200 NO_x mg/dscm (roughly 147 ppmvd – 24 hour basis). The design data from 1994 specified a NO_x concentration of 100 mg/dscm (~73 ppmvd).¹² According to the required declaration of compliance published in the local newspaper:¹³

“Tutti i valori sono nella norma e l’NO_x (ossidi di azoto) è intorno a 120 mg/metro cubo.”
This means “All of the values are within the norm and NO_x (nitrogen oxides) are approximately 120 mg/dscm (~88 ppmvd).”

More recently, at the 2003 meeting of the WTER Council in Tampa, the Brescia facility was the subject of the key lecture. The representative from Brescia reported that the plant achieves 80 mg/dscm (~ 58 ppmvd). This is actually a typical value for MWC’s in countries such as Italy, Switzerland, Austria, Germany, and Holland where even lower numbers are often achieved. Values in the U.K, France, Sweden, and the U.S. e.g. are typically higher.

In fact, according to more recent information about the facility, emissions during the second half of 2003 were between 30 and 40 mg/dscm (roughly 20 to 30 ppmvd). The data are shown in the table on the following page taken from the 2004 report of the “Observatory” (comprised of citizens, outreach experts, government and environmental officials, academia, etc.) that oversees the function of the facility for the general public.¹⁴

At a meeting with the Department, the County related some potential problems at Brescia such as visible emissions caused by excess ammonia emissions interacting with acid gases.¹⁵ The County also provided information from 2003 showing concurrently low NO_x and high NH₃ emissions of 48 and 53 ppmvd, respectively.¹⁶ The Department believes the technical explanation is overuse of ammonia to achieve NO_x values of 20 to 50 ppmvd and not from operating the SNCR system as designed (to meet ~73 ppmvd).

Martin GmbH provides systems “which optionally use an *insitu* NH₃ laser measuring signal, minimize aqueous ammonia consumption, and substantially reduce ammonia slip. The system injects aqueous ammonia in the correct temperature window by controlling injection as a function of the prevailing combustion conditions.” Martin GmbH claims to have “successfully installed SNCR systems in several Central European plants and attained guaranteed NO_x values (in some cases down to levels below 70 mg NO_x/Nm³ (~ 50 ppmvd)) with low ammonia slip in the flue gas upstream of the flue gas cleaning system.”¹⁷ (Emphasis added). They did not claim to achieve values in the 20 to 50 ppmvd range without causing visible emissions.

TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

**Table 5. Risultati degli Ulteriori Monitoraggi Periodici Effettuati da ARPA Anno 2003.
Results of Periodic Monitoring Conducted by the Regional EPA in 2003.**

Data dell'indagine	CO Monossido di Carbonio		SO ₂ Biossido di Zolfo		NO _x Ossidi di Azoto		Hg Mercurio		NH ₃ Ammoniaca	
	Valore limite* 50 mg/100 m ³ media giornaliera 200 mg/100 m ³ media araria		Valore limite* 100 mg/100 m ³ media giornaliera 200 mg/100 m ³ media araria		Valore limite* 200 mg/100 m ³ media giornaliera 400 mg/100 m ³ media araria		Valore limite* 0,05 mg/100 m ³ media araria		mg/100 m ³ **	
	linea 1	linea 2	linea 1	linea 2	linea 1	linea 2	linea 1	linea 2	linea 1	linea 2
9 gennaio 2003	20,2	-	01	-	66,8	-	0,0007	-	9,6	-
14 gennaio 2003	-	15,9	-	0,8	-	90,2	-	0,0009	-	-
23 gennaio 2003	-	16,5	-	0	-	92	0,0011	-	0,5	-
30 gennaio 2003	-	-	-	-	-	-	-	<0,0005	-	0,2
5 febbraio 2003	-	-	-	-	-	-	0,0013	-	-	-
14 febbraio 2003	17,4	-	0	-	45,9	-	-	0,0008	-	-
19 febbraio 2003	11,8	-	0	-	35,6	-	0,0012	-	-	-
26 febbraio 2003	-	18,4	-	0	-	50,8	-	0,0007	-	-
7 marzo 2003	-	-	-	-	-	-	0,0013	-	-	-
13 marzo 2003	-	22	-	0	-	35	0,0009	-	-	-
20 marzo 2003	20,4	-	0	-	44,7	-	-	<0,0005	-	-
29 marzo 2003	-	15,6	-	0	-	54,8	0,0018	-	-	-
4 aprile 2003	21,6	-	0	-	47,7	-	-	0,0012	-	-
9 aprile 2003	-	21	-	0	-	59,9	0,0012	-	-	-
17 aprile 2003	18	-	0	-	49,5	-	-	0,0029	-	-
2 maggio 2003	-	21,1	-	0	-	45,8	0,0035	-	-	-
8 maggio 2003	-	25,4	-	0	-	51,3	-	0,0012	-	-
15 maggio 2003	-	22,9	-	0	-	47,9	-	0,0015	-	6,9
22 maggio 2003	-	21,3	-	0	-	49,8	-	0,0011	-	-
29 maggio 2003	-	24,6	-	0	-	44,1	-	0,0011	-	-
5 giugno 2003	21,3	-	0	-	49,8	-	0,0009	-	-	-
13 giugno 2003	-	-	-	-	-	-	-	0,0009	-	-
19 giugno 2003	-	-	-	-	-	-	0,0031	-	-	-
24 giugno 2003	-	-	-	-	-	-	-	<0,0005	-	-
4 luglio 2003	-	-	-	-	-	-	<0,0005	-	-	-
10 luglio 2003	12,5	-	0	-	32,9	-	-	0,0027	-	-
31 luglio 2003	-	16,6	-	0	-	38,2	<0,0005	-	-	-
8 agosto 2003	14	-	0	-	37,6	-	-	0,0007	-	-
12 agosto 2003	-	-	-	-	-	-	-	0,0012	-	-
22 agosto 2003	14,5	-	0	-	38,8	-	-	0,0009	-	-
29 agosto 2003	-	16,2	-	0	-	35	0,0004	-	-	-
4 settembre 2003	-	-	-	-	-	-	0,0015	-	-	-
12 settembre 2003	14,4	-	0	-	41,3	-	0,0009	-	5,4	-
25 settembre 2003	15,4	-	0	-	36,7	-	<0,0005	-	-	-
2 ottobre 2003	12,7	-	0	-	35,1	-	-	0,001	-	-
8 ottobre 2003	-	11	-	0	-	34,2	0,0008	-	-	-
14 ottobre 2003	11,4	-	-	-	-	-	-	0,0012	-	-
23 ottobre 2003	-	12	-	0	-	34,7	0,0005	-	-	9,1
31 ottobre 2003	18,6	-	0	-	36,8	-	-	0,0008	-	-
6 novembre 2003	-	11,1	-	0	-	39,9	<0,0005	-	-	-
20 novembre 2003	19,5	-	0	-	28,6	-	-	0,0009	-	-
2 dicembre 2003	-	17,1	-	0	-	30,9	<0,0005	-	-	-
19 dicembre 2003	-	-	-	-	-	-	0,0021	-	7,5	-
23 dicembre 2003	-	-	-	-	-	-	-	<0,0005	-	-

* valore limite stabilito da autorizzazione del 6/12/2000 della Regione Lombardia.
** la normativa sia Italiana che Europea non stabilisce alcun valore limite.

Selective Catalytic Reduction (SCR) Process

There are hundreds of examples of SCR for the control of NO_x. Numerous installations exist in the United States, Europe and Japan. Most of the projects have been conducted in the electric power industry for a wide selection of fuels, energy cycles. A substantial number of European MWC's rely on SCR.

SCR relies on the same principle as SNCR. The reactions occur at lower temperatures and require a catalyst, typically containing vanadium, titanium, or zeolite. Based on the design of the catalyst and operating conditions, the temperature window is between 200 and 600 °C. Newer catalysts may be available that are effective at even lower temperatures.

There are three possible SCR system configurations to integrate the SCR reactor into the flue gas cleaning chain.¹⁷ These configurations are: high dust, low dust, or tail end and are shown, with special focus on the high dust system, in the following figure.¹⁸ The type of SCR configuration employed at a given plant depends on site-specific parameters such as flue gas dust loading, SO₂ concentration, and whether the SCR unit is integrally designed with the plant or retrofitted.

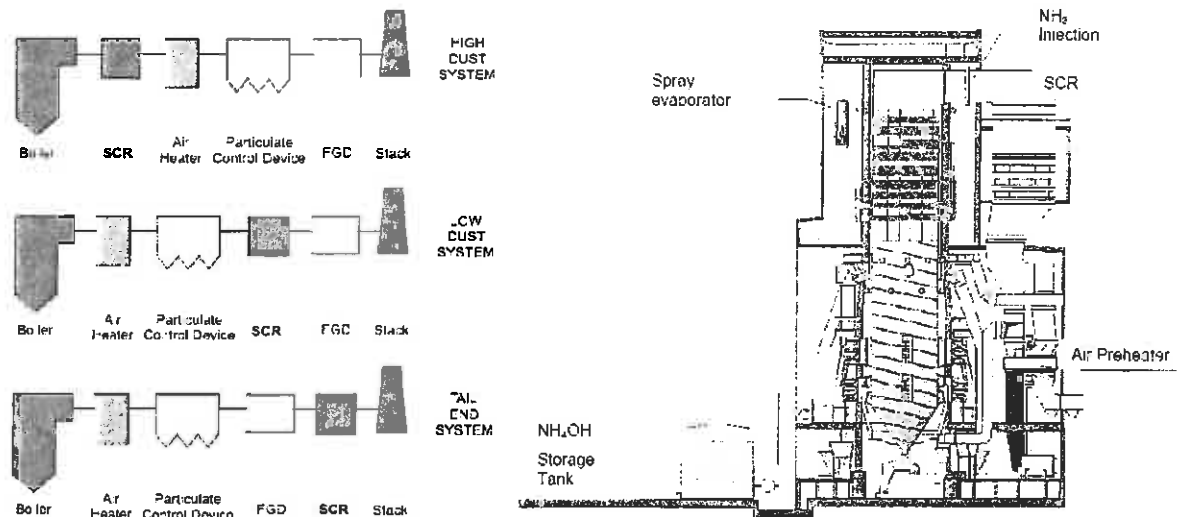


Figure 8. Possible Locations of SCR Reactor and Detail of “High Dust System”.

Numerous high dust applications have been built or are under construction, for example at the Gulf Crist Power Plant in Pensacola and the TECO Big Bend Station in Tampa. As previously mentioned, a high dust system will be installed at ARM Brescia in Italy. The “low dust” system shown above is used at a number of European MWC’s.

MWC equipment manufacturer, VonRoll describes the low dust system as “DeNO_x on the hot side”. In a MWC, the flue gas is cooled to approximately 260 °C (500 °F). The SCR system is located between the electrostatic precipitator (ESP) and flue gas desulfurization device such as a wet scrubber. This option would not be straightforward at Hillsborough County because the SD and FF combination is basically an integrated unit unlike the ESP/WS combination.

An example of the “tail end SCR” system was designed in the late 1980’s and started up at the Spittelau Plant in Austria in 1991. The plant and the SCR module are shown in the following photographs.

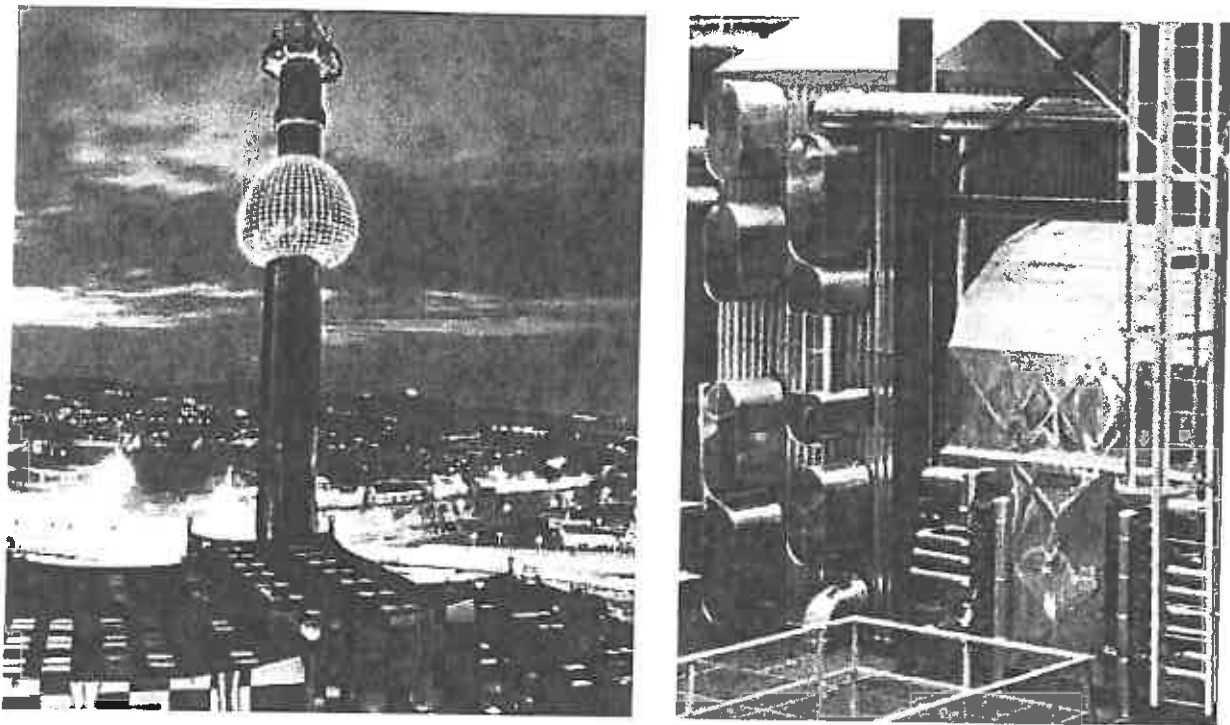


Figure 9. Spittelau Thermal Waste Treatment Plant. Tail End SCR System at Spittelau

The system is described in the operator's brochure as follows:¹⁹

"The DeNO_x facility, as the final stage of the flue gas treatment process, utilizes selective catalytic reduction (SCR). The flue gas streams from both treatment lines are combined, mixed with vaporized ammonia water (NH₃) and heated to a reaction temperature of 280 °C by a heating tube and gas duct burners.

"Passing through the 3 catalytic converter stages causes the nitrogen oxides (NO_x) to react with the added ammonia and the oxygen in the flue gas to form nitrogen and steam, and also results in dioxin and furan destruction. The resultant exhaust gas is then cooled to 115 °C in the third heat exchanger and finally released into the atmosphere through a 126 m high stack."

Austria has an emission limit of 100 mg NO_x/dscm (~70 ppmvd @15% O₂) for MWC's. The City of Vienna limits emissions from the Spittelau Plant to 37 mg/dscm (~25 ppmvd).

Emissions data are available at: www.fcc.at/sauberbrenner/sauberbrenner/em_wertspit.html
For reference the initial testing conducted on the facility indicated NO_x emissions in the range of 25 to 30 mg/dscm (~ 18 to 21 ppmvd).

Review of Hillsborough County SCR Cost Estimate

The County included a design and cost estimate for SCR at the proposed Unit 4. The County acknowledged possible NO_x reductions ranging from 50 to 90% and commented that the technology has not been applied to MWC's in the U.S. The County listed a number of facilities where SCR is practiced in Europe and documented emissions between 0 and 90 ppmvd. The majority of values were in the range of 25 to 50 ppmvd.

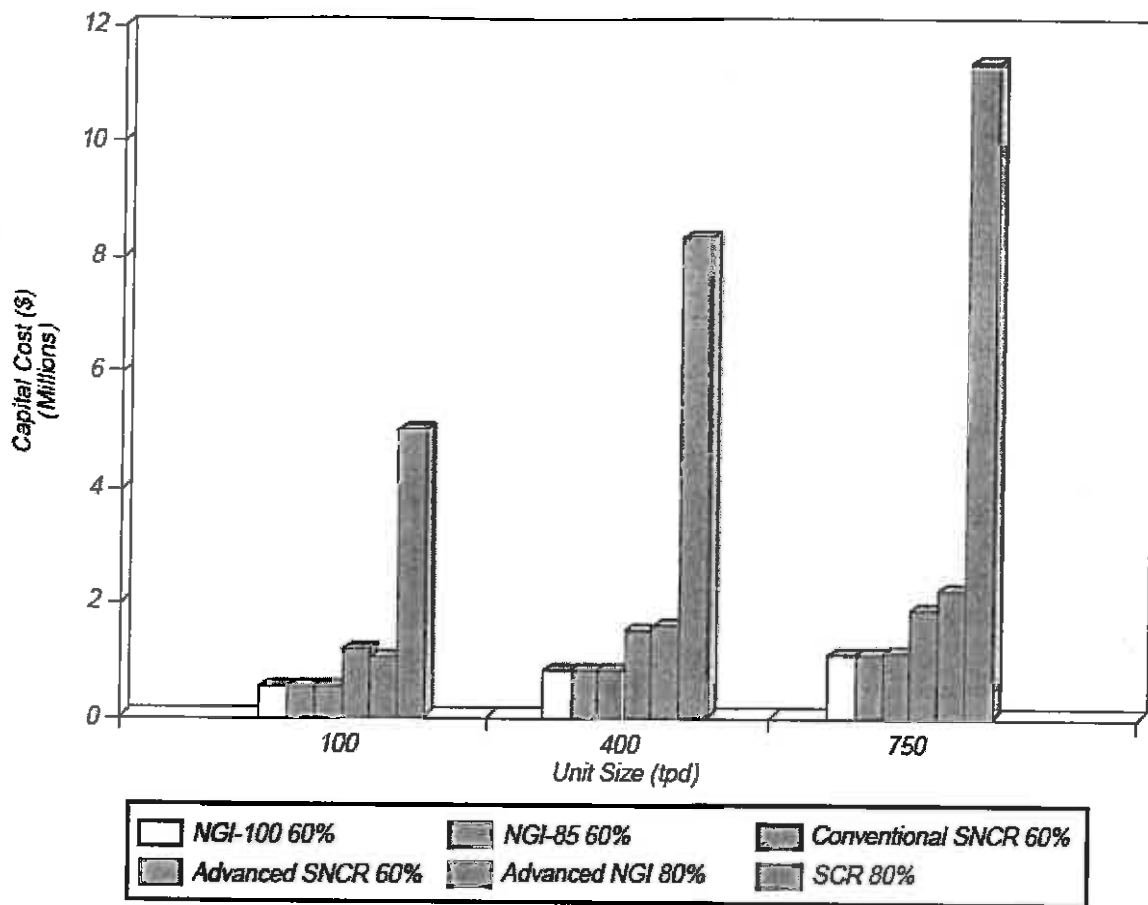


Figure 10. Capital Costs of NO_x Control Strategies for Different Sized MWC's.

The following table presents capital costs for SNCR per ton of installed capacity for four different class sizes of MWC's. Other categories include "tipping fee impacts" and the familiar cost-effectiveness parameter. Costs are presented within each category for three different levels of technology indicated by percent (%) NO_x reduction. Cost estimates for the 600 TPD MWC were interpolated by the Department from 400 and 750 TPD class estimates.

Table 7. Model Plant Cost Estimates for Conventional SNCR* (EPA, 1995)

Reduction (%)	Total Capital Cost (\$1000/TPD Capacity)			"Tipping Fee Impact" (\$/ton MSW)			Cost Effectiveness (\$/ton NO _x)		
	45	60	65	45	60	65	45	60	65
100 TPD MWC	5.1	5.1	5.1	3.7	3.9	4.1	4,300	3,380	3,235
400 TPD MWC	2.0	2.0	2.0	1.3	1.5	1.6	1,500	1,270	1,290
600 TPD MWC	1.7	1.7	1.7	1.1	1.3	1.4	1,240	1,190	1,070
750 TPD MWC	1.5	1.5	1.5	0.9	1.1	1.2	1,050	940	990

The values do not change much within a given class size with respect to the percent of NO_x removed. The most notable points regarding the 600 TPD class MWC are:

- Control by SNCR is very cost-effective and more so with increasing NO_x reduction;
- The “Tipping Fee Impact” is minimal – less than 3% of the facility tipping fee; and
- The capital cost is low – around 1% of the cost of the proposed County project.

“Tipping fee impact” is an incremental cost that indicates the potential cost of the technology on the MSW generator. However, it does not necessarily reflect the amount by which the plant's tipping fee will actually increase as a result of applying the control technology.

“Advanced SNCR” (for the time) assumes use of furnace pyrometry and additional process controls to also achieve 60% reduction with less reagent (less slip, plume potential) than is needed for conventional SNCR. Based on the previous figure, the capital cost of advanced SNCR would be less than \$2,000,000.

The following figure compares the various strategies in terms of the traditional cost-effectiveness analysis. The precise cost-effectiveness of conventional SNCR (at 60% removal) is, per the above table, \$1,190/ton NO_x removed. By interpolation within the following figure, the cost-effectiveness of advanced SNCR is somewhere between \$1,500 and 2,000/ton removed and clearly cost-effective. By interpolation, the cost-effectiveness of SCR would be roughly \$7,000/ton which some experts would (today) consider cost-effective by the traditional methodology.

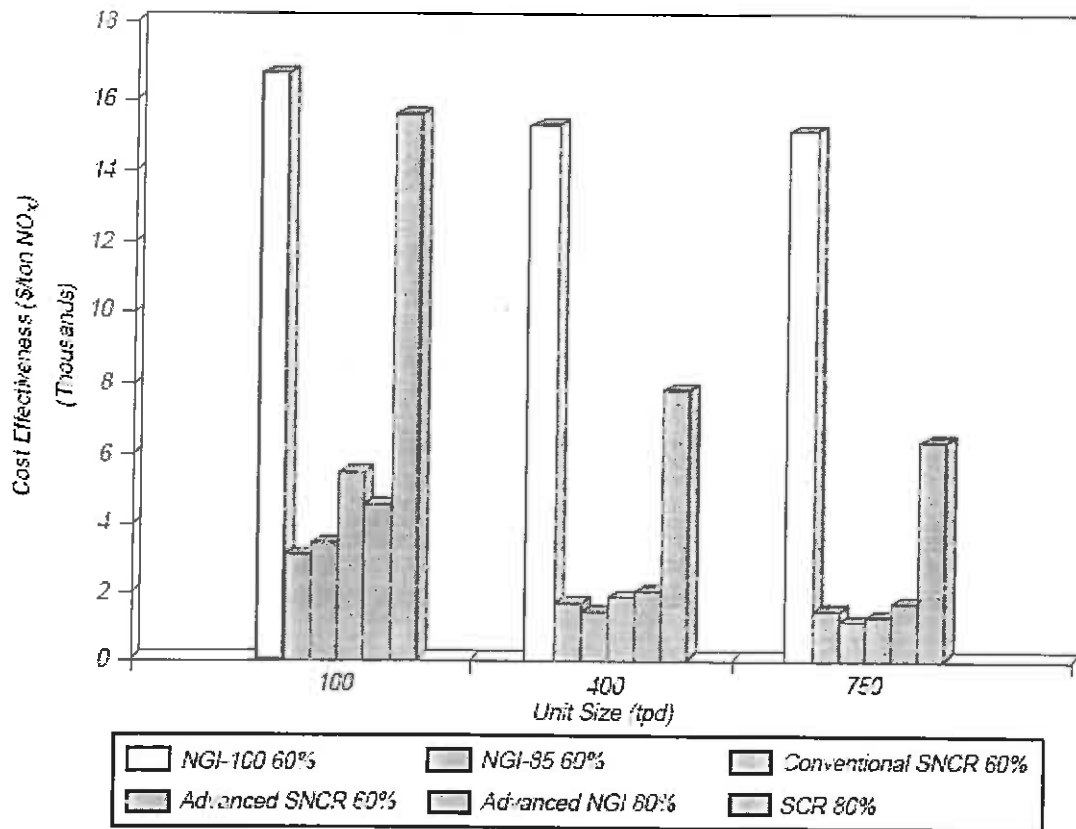


Figure 11. Estimated Cost-Effectiveness of NO_x Control for MWC's (EPA 1995).

The following figure is a cost comparison between the different strategies and tipping fees.

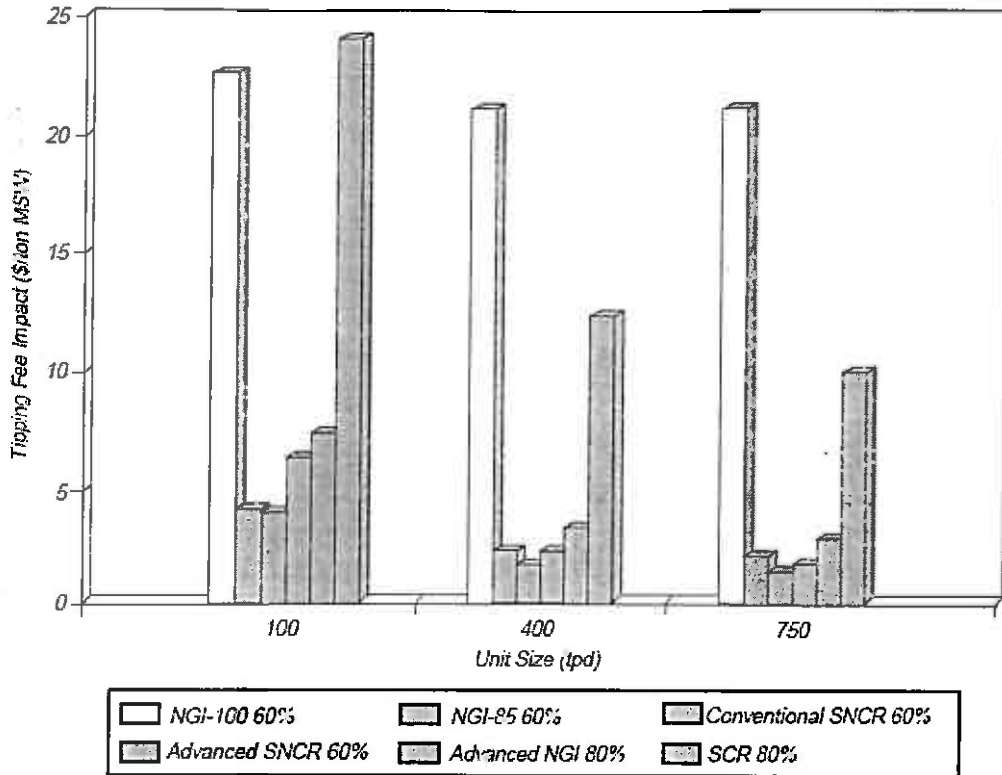


Figure 12. Impacts of NO_x Control on MWC Tipping Fees MWC's (EPA 1995).

The “tipping fee impact” values for SNCR and SCR can be compared with approximate estimates of tipping fees in Florida to determine possible impacts on Florida’s solid waste disposal practices. This comparison reveals that installation of SCR could (currently) significantly increase tipping fees at MWC facilities and could cause facilities to reassess land disposal options.

In 2000, tipping fees at Class I Florida MSW landfills (with leachate collection, liners, monitoring, gas collection, etc.) averaged \$42.85 per ton. At the same time, MWC tipping fees averaged \$55.22 statewide and could be more today given federally mandated air pollution control improvements at some of the facilities.²³ As shown in the above graph, the use of conventional or advanced SNCR does not significantly impact the tipping fees at MWC’s. It is estimated that SNCR controls equate to \$1.30 to \$2.00/ton of waste or between 2.5 and 4% of the tipping fees.

Interpolation of the results of the graph above for 400 and 750 TPD MWC’s suggests that the cost of SCR on a 600 TPD MWC is on the order of \$11/ton of waste, potentially five times higher than the SNCR component within the tipping fee. This equates to 20% of the average tipping fee in 2000 for MWC’s. Based on the interpolation of the above EPA graph, the comparative effect of SCR is an incremental impact of \$9.00 to 9.70. This is equivalent to 16 to 18% in terms of a tipping fee impact (assuming costs are passed on).

The additional capital cost and tipping fee impact for SCR can be important factors when assessing whether to expand an existing MWC facility or pay the shipping costs to a Class I landfill with a lower tipping fee.

The Department accepts the County's proposal to limit NO_x to 110 ppmvd on a 24-hour basis. The overwhelming evidence suggests a long term value of 90 ppmvd can be attained with the planned design and with minimal visible emissions. A 12-month averaging time will compensate for seasonal factors affecting the waste stream. The limits comprise BACT and are the lowest values for a MWC in the U.S.

Recent information from Europe suggests that with experience they have reduced the differential between SNCR and SCR. In one study conducted for the European Commission, the difference between the options was approximately €4.50/metric tonne (approximately \$5.00/ton) for an installation in Flanders (Belgium).²⁴

There are future possibilities for achieving low NO_x values using tail end SCR systems by more cost-effective means than the SCR system describe by the County. One is to use porous extrudates in a packed reactor.²⁵ Dürr Environmental claims to have achieved 90% removal with a system for a chemical process to treat an exhaust of 29,250 standard cubic feet per minute (scfm) with a temperature of 250 °F. For comparison, the clean exhaust flow rate from Unit 4 will be approximately 91,000 scfm and 270 °F.

For reference ARM Brescia in Italy plans to install a high dust SCR system on one line as a large-scale demonstration project under a European initiative called "NextGenBiowaste".²⁶ If successful, high dust SCR may prove to be more cost-effective than the tail end systems with reheat.

Such systems might in the future prove to be a less expensive option to achieve very low emissions than tail end SCR using conventional catalysts or even enhanced SNCR systems in conjunction with FGR, water-cooled grates, furnace controls, etc. The Department will require future applicants to research and develop the costs for high dust and low temperature tail end SCR systems for comparison with enhanced SNCR.

4.4 CO Formation and Control

Incomplete burnout is the cause of CO emissions. Time, temperature, and turbulence are the keys to good combustion given the often wet and variable quality of fuel. According to the County's estimate, annual CO emissions will be 113 TPY and the project barely triggers PSD and a BACT determination for this pollutant.

EPA did not review CO emissions from mass burn facilities in the latest update of Subpart Eb. However, EPA defined a new category for existing facilities that converted to a "refuse-derived fuel" (RFD) process. The main facility affected was the Miami-Dade County RRF, believed to be the largest in the world. The CO limit was increased from 200 to 250 ppmvd on a 24-hour basis.

The limit for new mass-burn MWC's was not changed and is 100 ppmvd on a 4-hour block basis. The applicant proposed 80 ppmvd as BACT on a 4-hour block. In the case of the Lee County Project, the CO limits were 100 ppmvd on a 4-hour block and 80 ppmvd on a 30-day rolling average.

Although statistics from Lee County Units 1 and 2 indicate that 80 ppmvd is achievable on a 4-hour block, the Department will limit Hillsborough Unit 4 to the Subpart Eb limit of 100 ppmvd on a 4-hour basis. The rationale is that FGR can increase CO limits due to recirculation of exhaust gas and lower O₂ concentration in the furnace. The Department prefers to leave intact any flexibility afforded by the higher 4-hour limit to help minimize NO_x emissions (i.e.

allow maximum feasible FGR). This will also minimize the probability of exceeding a 24-hour CO limit as occurred with some of the Miami-Dade RRF units.

The Department is confident, however, that if the facility meets 100 ppmvd on a 4-hour basis, it will achieve a 30-day BACT limit of 80 ppmvd of CO.

4.5 MWC Acid Gases

MWC Acid Gases (MWC-AG) is a PSD category and requires a BACT determination. MWC AG is comprised of SO₂ and HCl. The sum of the two components is estimated by the applicant to be 195 TPY based on the separate limits for each proposed by the County to meet Subpart Eb. The Department will address the two components of MWC-AG separately.

SO₂ Formation and Control

The Department assessed industrial SO₂ emission trends in Hillsborough County since 1998. Between 1998 and 2005 emissions of SO₂ were reduced by approximately 160,000 tons per year from TECO's power plants.²⁷ By comparison the proposed increase (before application of the Department's BACT analysis) from Hillsborough County Unit 4 is 84 TPY. While this point is not the key factor in a BACT determination, it does help put the issue in better perspective.

Emissions of SO₂ from MWC's are generally low even before control. Referring back to Table 2, the recent Subpart Eb regulation did not change the SO₂ limit. The Department previously set a limit of 26 ppmvd for the Lee County Unit 3 project that is less than the value of 30 ppmvd in Subpart Eb.

After excluding "outliers", EPA's consultant evaluated SO₂ data for the SD/FF/ACI/SNCR configuration during the development of the new Subpart Eb. The mean of the data retained was 6.4 ppmvd. EPA's consultant estimated that 95 and 99% of data are less than 17 and 22 ppmvd respectively when assuming a "normal distribution". The Lee County RRF BACT SO₂ value is still acceptable as BACT and typical emissions will likely be less than 10 ppmvd.

Hydrogen Chloride (HCl)

HCl is not a PSD pollutant. The Department will include the Subpart Eb limit of 25 ppmvd or 95% control in the permit. After excluding "outliers", EPA evaluated HCl data for the SD/FF/ACI/SNCR configuration during the development of the new Subpart Eb. The mean of the data retained was 8.5 ppmvd. EPA estimated that 95 and 99% of data are less than 19 and 24 ppmvd respectively when assuming a normal distribution.

The Department notes, however, that it may be necessary at times for the County to inject more lime slurry to minimize HCl emissions to avoid ammonium chloride (NH₄Cl) as a result of excess urea use to control NO_x.

Conclusion on MWC Acid Gases

Based on the previous discussions, it is likely the sum of the two pollutants will actually be on the order of 15 ppmvd and annual emissions are likely to be less than 100 TPY.

It is possible to conduct a "co-incident analysis" of (SO₂ + HCl) to set a BACT for MWC-AG that is less than the sum of the two NSPS limits. However the Department has determined that the individual limits for SO₂ and for HCl in Subpart Eb are adequate as BACT for SO₂ and MWC-AG and will not include a separate limit to track as MWC-AG.

4.6 MWC-Metals, PM/PM₁₀

MWC Metals is a PSD category and requires a BACT determination because estimated annual emissions of 25 TPY are greater than the significant emission threshold of 15 TPY for this pollutant. PM is the measured surrogate for MWC Metals and has a greater PSD threshold of 25 TPY. PM limits are often set after determining BACT for PM₁₀. Typically applicants agree to lower values than BACT for PM to avoid conducting more difficult PM₁₀ fractionation and measurement. The Department will address the two components of MWC-Metals separately.

Particulate Matter (PM)

The applicant initially proposed a PM/PM₁₀ limit value of 20.6 mg/dscm to simultaneously satisfy BACT for PM/PM₁₀ and MWC-Metals. However adherence to the new Subpart Eb emission limit of 20 mg/dscm immediately reduces the annual emissions of PM (also of PM₁₀ and MWC-Metals) to a little less than 24 TPY. By adherence to this value, PSD for PM is not triggered, but PSD for MWC Metals and for PM₁₀ is triggered.

For reference, after excluding “outliers”, EPA’s consultant evaluated PM data for the SD/FF/ACI/SNCR configuration during the development of the new Subpart Eb. The mean of the data retained was 3.2 mg PM/dscm. EPA estimated that 95 and 99% of data are less than 7.6 and 9.5 mg/dscm respectively when assuming a normal distribution.

Particulate Matter less than 10µ in Diameter (PM₁₀)

The applicant’s initial PM₁₀ limit value of 20.6 mg/dscm would have triggered PSD category and a BACT determination because originally estimated annual emissions of ~24 TPY are greater than the significant emission threshold of 15 TPY for this pollutant. If 9.5 mg PM/dscm is greater than 99% of the PM data reviewed by EPA, then it is logical to conclude that PM₁₀ emissions are even less.

A value of 12 mg/dscm for PM₁₀ would be reasonable to expect when PM emissions are 20 mg/dscm as provided by Subpart Eb. This level would satisfy BACT, but would actually reduce PM₁₀ annual emissions to 14.6 TPY and less than the PSD threshold.

Conclusion on MWC-Metals

A value of 12 mg/dscm for MWC-Metals (such as determined for PM₁₀) would also satisfy BACT for MWC-Metals. This value will actually reduce annual emissions to 14.6 TPY and less than the PSD threshold for MWC-Metals.

A single value of 12 mg/dscm for PM/PM₁₀/MWC-Metals would constitute BACT for the three parameters, but would reduce emissions below the PSD thresholds. The Department has determined that all three parameters can meet this concentration limit and will include in the permit to avoid PSD and a BACT determination while satisfying Subpart Eb.

4.7 Sulfuric Acid Mist (SAM)

The applicant estimated annual SAM emissions of 74 TPY. This value is greater than the PSD significant emission rate threshold of 7 TPY. The Department reviewed historical Annual Operating Reports (AOR’s) from the facility for the year before and all of the years after it was upgraded to comply with the 40CFR60 Subpart Cb requirements for existing MWC’s. SAM emissions for Units 1, 2, and 3 combined were reported as 28.5 tons in 2000. Thereafter, the

applicant has reported emissions from the three units combined of approximately 1 TPY through 2005.

The Department reviewed the measured data from stack tests conducted at the completion of the control equipment to SD/FF/ACI/SNCR. The values were 0.00026, 0.0002, and 0.00033 grains per dry standard cubic foot (gr/dscf) compared with a limit of 0.072 gr/dscf. Thus measured emissions were less than 1% of the applicable concentration limit.

There is no SAM-limiting standard in the recent Subpart Eb update. The Department believes that the SD/FF/ACI/SNCR configuration as a work practice and the emission limitations for MWC Acid gases, and PM/PM₁₀, provide reasonable assurance that the proposed Unit 4 will not emit 3 or more TPY of F. It is unnecessary to set a BACT based limit for this pollutant or require testing given the history detailed above.

4.8 Fluorides (F)

The applicant originally estimated annual fluoride emissions of 3.5 TPY, a value that exceeds the PSD significant emission rate threshold of 3 TPY. The Department reviewed historical data from the facility since it was upgraded to comply with the 40CFR60 Subpart Cb requirements for existing MWC's and found that annual emissions are always much less than 3 TPY. The annual test data are given in the following table.

Most if not all of the measured values were in the "non-detect" using the standard EPA methods. The operator reported the values in a conservative manner such that the "limit of detectability" was used to estimate emissions. Assuming fulltime operation, the sum of emissions from the three units is less than 0.4 TPY of F.

There is no fluoride-limiting standard in the recent Subpart Eb update. The Department believes that the SD/FF/ACI/SNCR configuration as a work practice and the emission limitations for MWC Acid gases, and PM/PM₁₀, provides reasonable assurance that the proposed Unit 4 will not emit 3 or more TPY of F. It is unnecessary to set a BACT based limit for this pollutant or testing requirements given the history detailed above.

Table 8. Fluoride Emissions from Hillsborough County Resource Recovery Facility

<u>Year</u>	<u>Unit 1 (lb/hr)</u>	<u>Unit 2 (lb/hr)</u>	<u>Unit 3 (lb/hr)</u>
2001	0.017	0.017	0.023
2002	0.021	0.034	0.035
2003	0.019	0.017	0.017
2004	0.017	0.017	0.017
2005	0.016	0.015	0.015

4.9 Lead (Pb) and Cadmium (Cd)

Pb is a PSD pollutant but its emissions are not significant for this project. Cd is not a PSD pollutant. The emission limits for both pollutants were modified by the new Subpart Eb. The

Department will replace the applicant's proposed values with the new Subpart Eb limits. These are 140 and 10 µg/dscm respectively.

4.10 Hg Release and Control

Mercury is released during combustion. The primary sources of mercury in MSW include: batteries; mercury containing devices such as thermostats; thermometers and switches; and lighting.

The following data was provided by the County and lists the results of Hg inlet and outlet tests on several Martin/Covanta facilities with the SD/FF/ACI/SNCR configuration in Florida.

Table 9. Hg Concentrations (µg/dscm), Removal Efficiencies (%) Key Covanta Facilities

Facility		Lee County RRF			Pasco County RRF			Hillsborough Co. RRF		
Date	Unit	Inlet	Outlet	%	Inlet	Outlet	%	Inlet	Outlet	%
2001	1	198	23	87	674	13	96	226	9	96
	2	119	28	76	219	12	95	145	6	96
	3	-	-	-	190	6	97	243	9	96
2002	1	240	12	95	109	12	88	142	7	95
	2	130	11	92	149	10	94	149	8	95
	3	-	-	-	144	3	96	149	8	95
2003	1	127	26	79	118	3	97	221	21	90
	2	257	31	87	143	5	96	156	8	95
	3	-	-	-	247	4	97	130	14	89
2004	1	173	23	87	127	13	87	145	15	90
	2	94	15	84	96	12	87	187	18	90
	3	-	-	-	116	7	93	106	19	82
2005	1	166	36	77	160	4	96	141	23	82
	2	183	14	91	101	8	92	77	21	72
	3	-	-	-	88	5	94	155	18	86

The measurements indicate that historically, Hillsborough and Pasco RRF's have Hg characteristics that comply with standard proposed by the Department for Unit 4. Lee County's values are well within their permit limits (70 µg/dscm) for their first two Units. The new Lee County RRF Unit 3 that is under construction will meet a limit of 28 µg/dscm and may require some additional carbon injection to meet that limit.

The applicant proposed a concentration limit of 28 µg Hg/dscm or 85% removal (whichever is less stringent). In calculating potential to emit (PTE), the County assumed 85% removal from an incoming stream of 890 µg Hg/dscm yielding as much as 134 µg/dscm after treatment. This

results in PSD-significant emissions of 0.163 TPY (326 lb/year), thus triggering a PSD review and BACT determination.

Given the emission data in the above table, the Department expects typical emissions less than 20 $\mu\text{g Hg/dscm}$ and on the order of 40 lb Hg/year. For reference, all 13 measurements for the similar Brescia configuration are listed in Table 5. These were taken from the previously-mentioned "Osservatorio Report" and were less than 4 $\mu\text{g Hg/dscm}$.

After excluding "outliers" EPA's consultant evaluated Hg data for the SD/FF/ACI/SNCR configuration during the development of the new Subpart Eb. The mean of the data retained was 8 $\mu\text{g/dscm}$. EPA's consultant estimated that 95 and 99% of data are less than 22 and 27 $\mu\text{g Hg/dscm}$ respectively when assuming a "normal distribution". EPA's consultant also estimated that 95 and 99% of data are less than 25 and 49 $\mu\text{g/dscm}$ respectively when assuming a "log-normal distribution". In the Final Rule Preamble EPA stated:

"A 50 percent reduction in inlet mercury levels suggests an emission limit of 40 $\mu\text{g/dscm}$ in the MACT standards. Public comments and test data suggested that levels less than 30 $\mu\text{g/dscm}$ are being achieved. However, in consideration of the potential use of mercury CEMS (Hg-CEMS) and the higher mercury variability that may be observed with CEMS use, the final standards were set at 50 $\mu\text{g/dscm}$ for both existing and new MWC units."

Hillsborough County's proposed value of 28 $\mu\text{g Hg/dscm}$ is significantly less than the value of 50 $\mu\text{g/dscm}$ set by EPA. However the Department believes that lower values than 28 $\mu\text{g/dscm}$ will be achieved, as suggested by the above table, by optimization of the ACI equipment in combination with real-time Hg data to optimize the system. If that value is not met then an 85% removal standard applies and the data show that this removal requirement is typically met even when it is not applicable.

The Department will set a limit of 28 $\mu\text{g Hg/dscm}$ or 85% removal (whichever is less stringent) as requested by the applicant. The first value equates to approximately, 68 lb/yr which substantially less than the PSD threshold of 200 lb Hg/yr. However, the applicant estimated potential to emit (PTE) at 326 lb/year based on the assumption of 890 $\mu\text{g/dscm}$ in the flue gas before treatment and removal by the SD/FF/ACI components of the control system.

To insure that PSD is not triggered, the Department will set an annual emission limit of 190 lb Hg/year to be monitored by use of a mercury CEMS. To exceed 190 lb Hg/year would require continuous emissions averaging 48 $\mu\text{g Hg/dscm}$ which is approximately equal to the value set by EPA through Subpart Eb.

The Department is presently writing regulations pursuant to EPA's Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR). CAMR requires installation of recently developed or improved (3rd Generation) continuous emission monitoring system (CEMS) for Hg at power plants for the purpose of accurately measuring and trading Hg allowances in such a manner that total statewide Hg emissions will be reduced.

The latest Hg CEMS's undergoing evaluation by EPA are more accurate and precise than those heretofore available. The Department concludes that the 3rd generation Hg-CEMS will be available and reasonably accurate by the time Hillsborough County RRF Unit 4 starts operation. The Department will require the County install a Hg-CEMS within 24 months of startup, which is after the date by which the power plants install similar equipment.

In promulgating the latest Subpart Eb rule for MWC's, EPA recognized that Hg-CEMS are available and in use at several German MWC's. In the final rule, EPA allowed Hg-CEMS as an optional test methods since performance specifications are available. The owners or operators of a MWC would provide EPA a 30 day notice before starting to use the Hg-CEMS and a 30 day notice if they elect to discontinue the use of the CEMS. As an incentive for the optional application EPA removed the 90 and 95% monitoring availability requirements for the first 2 years of application.

The required use of the Hg-CEMS for the purpose of demonstrating annual emissions shall not constitute a request by the applicant to EPA for the purposes described above and does not relieve the applicant from the compliance requirements in Subpart Eb or pursuant to this determination. In applying the Subpart Eb Hg limit of 50 $\mu\text{g}/\text{dscm}$, the Department will follow the Hg limit and (at the request of the applicant) allow optional Hg-CEMS use as described in Subpart Eb.

After installation of the Hg-CEMS, the County may at its option choose to meet the limit of 28 $\mu\text{g}/\text{dscm}$ on a 12-month rolling average in the manner described for electric power plants pursuant to 40CFR60, Subpart Da.

The Department notes that the County's own regulations clearly suggest use of Hg-CEMS at MWC's. The rationale, which is to minimize emissions of dioxin/furan and Hg, is consistent with the view of the Department. For reference, the County's rule 1-3.53.1(f):²⁸

Municipal Waste Incinerators – mercury and dioxin/furan emissions shall be controlled by combustion practices, operation and maintenance, and operation of a carbon injection system. An alternative would be to install a continuous emission monitor for the pollutant mercury and adjust the carbon feed rate accordingly. This continuous emission monitor shall be installed and operated in accordance with a promulgated USEPA Performance Specification. Any such alternative must be approved by the Executive Director prior to implementation.

In applying the Department limit of 28 $\mu\text{g}/\text{dscm}$, the Department will use the standard EPA Hg stack testing methods, but require quarterly testing. After installation of the Hg-CEMS, the County may at its option achieve the limit of 28 $\mu\text{g}/\text{dscm}$ on a 12-month rolling average in the manner described for electric power plants pursuant to 40CFR60, Subpart Da.

4.11 MWC Organics, Dioxin/furan

MWC Organics is a PSD category and requires a BACT determination because estimated annual emissions are greater than the significant emission threshold (~ factor of 4). MWC Organics is comprised of CDD (dioxin) and CDF (furan). After excluding "outliers", EPA evaluated CDD/CDF data for the SD/FF/ACI/SNCR configuration during the development of the new Subpart Eb. The mean of the data retained was 2.4 ng/dscm . EPA estimated that 95 and 99% of data are less than 7.4 and 9.5 ng/dscm respectively when assuming a normal distribution.

The Department believes that Unit 4 will generally achieve the same value as the other units using the SD/FF/ACI/SNCR configuration. Measured emissions will likely be less than the PSD threshold although applicability is on the basis of "potential-to-emit" (PTE) requiring a BACT determination.

The Department will accept EPA's recent evaluation of Subpart Eb as BACT for this application. However, for future reference, the Department does not necessarily believe that the statistical procedures suitable for an NSPS limit are suitable for BACT pollutants in general. Fine tuning of ACI in conjunction with the Hg-CEMS will likely have some benefits in the control of MWC Organics as suggested by the Hillsborough County regulation.

4.12 Ammonia (NH₃)

The applicant specified a limit of 15 ppmvd for NH₃ slip for the SNCR system that will be installed for this project to meet 110 ppmvd when uncontrolled emissions are 350 ppmvd and the unit is operated at a heat input of 260 mmBtu/hr. Similarly, the applicant specified a limit of 10 ppmvd NH₃ when the heat input is 195 mmBtu/hr. These values are acceptable for the purposes of minimizing plume formation potential and PM/PM₁₀ emissions.

4.13 Emission Limits including BACT

The following table is a compilation of emission concentration or mass emission limitations based on Subpart Eb, the Department BACT determination or as necessary to avoid PSD and a BACT determination.

Table 10. Emission Limits Applicable to Hillsborough County RRF Unit 4

Pollutant	Emission Limit	Measurement Basis	Limit Basis
NO _x	110/90 ppmvd	24-hr/12-month CEMS	BACT
CO	100/80 mg/dscm	4-hr/30-day CEMS	BACT/Eb
MWC Acid Gases (SO ₂ /HCl)	26/25 ppmvd*	24-hr CEMS/Stack Test	BACT/Eb
MWC Metals/PM/PM ₁₀	12 mg/dscm	Stack Test	Avoid PSD
Ozone as VOC	NA	NA	NA
Sulfuric Acid Mist	NA	NA	NA
Fluorides (F)	NA	NA	NA
Lead (Pb)	140 µg/dscm	Stack Test	Subpart Eb
Mercury (Hg)	28 µg/dscm*	Quarterly Stack Test	Avoid PSD
Cadmium (Cd)	10 µg/dscm	Stack Test	Subpart Eb
MWC Organics (dioxin/furan)	13.0 ng/dscm	Stack Test	BACT/Eb
Ammonia (NH ₃)	15/10 ppmv	260/195 mmBtu/hr Stack Test	PM, Opacity
Opacity	10 percent	6-minute COMS	Subpart Eb

* Alternative 85 percent removal requirement applies.

The rationale for the values is discussed above. In the case of NO_x, the Department will allow an initial limit of 150 ppmvd for the first year of operation on a 24-hour basis but require attainment of 110 ppmvd on a 30-day basis. This will provide ample time to optimize the SNCR and FGR systems to achieve the lower guaranteed value of 110 ppmvd on a 24-hour basis beginning the second year of operation. At the same time a limit of 90 ppmvd on a 12-month block rolled monthly. Only forward months will be included in the calculation. Therefore the first 12-month block will be completed at the end of the second year of operation.

5. COMPLIANCE, EXCESS EMISSIONS, AND OTHER ISSUES

5.1 General Compliance Principles

With some exceptions, the Department will rely to the extent feasible on the test methods, exclusions, and excess emission provisions provided by Subpart Eb for most pollutants. Subpart Eb requires testing and monitoring for NO_x, CO, SO₂, HCl, PM, Pb, Hg, Cd, dioxin/furan and opacity as well as MWC operating parameters such as load level and flue gas temperature.

NO_x, CO and SO₂ are required to be measured using CEMS's. Opacity is required to be monitored using a COMS and measured by an annual visible emissions test. Annual visible emissions testing must be conducted to determine compliance with the fugitive ash emission requirements.

Emissions of other pollutants are determined by an annual stack test. An annual stack test using Method 5 is required for demonstration of compliance with the PM limit. The assumption can be made that all PM measured during the Method 5 stack test is actually PM₁₀. If, during the Method 5 test, the PM₁₀ limit of 12 mg/dscm is achieved, it is safe to assume that both PM and PM₁₀ limits have been met.

5.2 Compliance with Mercury Limit

Subpart Eb requires testing on an annual basis to demonstrate compliance with the applicable mercury standard using EPA Reference Method 29, or as an alternative ASTM D6784-02. In lieu of the required mercury testing, the owner or operator has the option to demonstrate compliance by the required Hg-CEMS. The applicable state rule for Waste-to-Energy Facilities (62-296.416, F.A.C.) requires a compliance demonstration for mercury using Method 29 on an annual basis.

Although the facility has chosen to show compliance with the federal standard using one of the annual stack test methods, the Department will require the facility to install, operate, and maintain a continuous monitoring system for the measurement of mercury emissions in addition to the stack testing requirements. Quality Assurance and Quality Control (QA/QC) procedures will be required to ensure proper maintenance of the CEMS system, and acquisition of acceptable quality emissions data. As part of the ongoing QA/QC of the CEMS, annual relative accuracy testing is required.

Upon approval by the Department, the CEMS may be used by the facility as the method of compliance with the applicable mercury limit. At that time, the Department may allow for the substitution of the quarterly stack testing requirement in the permit and the annual stack testing requirement in 62-296.416, with the data acquired during the annual relative accuracy tests.

6. AIR QUALITY IMPACT ANALYSIS

6.1 Introduction

The project as originally proposed by the applicant would increase emissions of eleven pollutant categories at levels in excess of PSD significant amounts: CO; NO_x; MWC-Acid Gases (SO₂+HCl); SO₂ as an individual pollutant; MWC-Metals; PM; PM₁₀; Mercury (Hg); MWC-Organics (dioxin and furans); Fluorides (F); and sulfuric acid mist (SAM). Subsequent evaluation by the Department and application of lower emission limits eliminated six of the pollutants from triggering PSD Review. They are MWC-Metals, PM, PM₁₀, Hg, F, and SAM.

PM₁₀, SO₂ and NO_x are criteria pollutants and have national and state ambient air quality standards (AAQS), PSD increments, significant impact levels and de minimis monitoring levels defined for them. Though the project will no longer trigger PSD for PM₁₀, the evaluation by the applicant is included below. CO is a criteria pollutant and has only AAQS, significant impact levels and de minimis monitoring levels defined for it. There are no applicable PSD increments, AAQS, significant impact or de minimis monitoring levels for MWC Acid Gases (SO₂+HCl) and MWC-Metals, or MWC-Organics. NO_x is an ozone (O₃) precursor and any net increase of 100 tons per year requires an ambient impact analysis including the gathering of preconstruction ambient air quality data for ozone (O₃).

6.2 Major Stationary Sources in Hillsborough County

The current largest stationary sources of air pollution in Hillsborough County are listed below. The information is from annual operating reports submitted to the Department.

Table 11. Major Sources of NO_x in Hillsborough County

<u>Owner</u>	<u>Site Name</u>	<u>Tons per year</u>
Tampa Electric Company	Big Bend Station (2004)	27,779
Hillsborough County	Resource Recovery Facility	598
Tampa Electric Company	Bayside Station (formerly Gannon)	453
City of Tampa	McKay Bay RRF	394
Hillsborough County	RRF Unit 4 (proposed PTE)	256
Mosaic Fertilizer	Mosaic Riverview	183
C.F. Industries	Plant City Phosphate	84

Table 12. Largest Sources of SO₂ in Hillsborough County

<u>Owner</u>	<u>Site Name</u>	<u>Tons per year</u>
Tampa Electric Company	Big Bend Station (2004)	11,917
Mosaic Fertilizer	Mosaic – Riverview Facility	4512
CF Industries, Inc.	Plant City Phosphate	4046
Gulf Coast Recycling, Inc.	Gulf Coast Recycling, Inc. (2004)	671
Hillsborough County	RRF Unit 4 (proposed PTE)	84

Table 13. Largest Sources of PM in Hillsborough County

<u>Owner</u>	<u>Site Name</u>	<u>Tons per year</u>
Tampa Electric Company	Big Bend Station (2004)	739
Tampa Electric Company	Bayside Station (formerly Gannon)	181
New NGC, Inc.	New NGC, Inc.	94
Kinder Morgan, LLC	Sutton Terminal	75
Mosaic Fertilizer	Mosaic – Riverview Facility	68
CF Industries, Inc.	Plant City Phosphate	60
E Associated Terminals CO	E Associated Terminal Rock Port	56
Conagra	Conagra	39
Gulf Marine Repair Corp.	Gulf Marine Repair	30
Hillsborough County	RRF Unit 4 (proposed PTE)	25

Table 14. Largest Sources of CO in Hillsborough County

<u>Owner</u>	<u>Site Name</u>	<u>Tons per year</u>
Tampa Electric Company	Big Bend Station (2004)	1065
Gulf Coast Recycling, Inc.	Gulf Coast Recycling, Inc. (2004)	972
New NGC, Inc.	New NGC, Inc. Apollo Beach (2004)	126
Hillsborough County	RRF Unit 4 (proposed PTE)	113
New NGC, Inc.	New NGC, Inc.	67
Tampa Electric Company	Bayside Station (formerly Gannon)	59

6.3 Air Quality and Monitoring in the Hillsborough County

The Hillsborough County Local Program operates thirty-five monitors at nineteen sites measuring PM₁₀, PM_{2.5}, ozone, lead, toxics, CO, NO₂ and SO₂. The 2005 monitoring network is shown in the figure below. Measured ambient air quality information is summarized in the subsequent table.

The highest measured values of all pollutants are all less than the respective National Ambient Air Quality Standards (NAAQS). Based on local emission trends, it is not likely that ground-level concentrations will approach the NAAQS levels, at least at the monitoring locations. One exception is ozone because it is formed from precursors that are clearly available (NO_x and VOC) from local industrial and transportation emissions. The tendency to form ozone is accentuated by hot ambient temperature, solar insolation, high pressure, and relatively low wind speed.

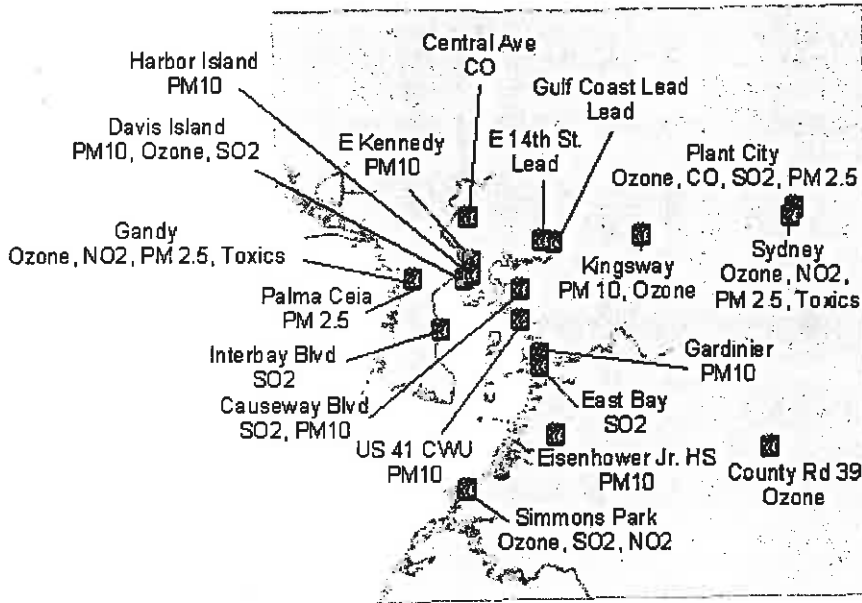


Figure 13. Hillsborough County Ambient Air Monitoring Network

Table 15. Ambient Air Quality in Hillsborough County Nearest to Project Site (2005)

Pollutant	Location	Averaging Period	Ambient Concentration				
			High	2nd High	Mean	Standard	Units
PM ₁₀	Causeway Blvd.	24-hour	76	69		150 ^a	ug/m ³
		Annual			26	50 ^b	ug/m ³
SO ₂	Causeway Blvd.	3-hour	84	65		500 ^a	ppb
		24-hour	21	12		100 ^a	ppb
		Annual			2	20 ^b	ppb
NO ₂	Gandy	Annual			8	53 ^b	ppb
CO	Central Ave.	1-hour	4	4		35 ^a	ppm
		8-hour	4	3		9 ^a	ppm
Ozone	Davis Island	1-hour	0.102	0.102		0.12 ^c	ppm
		8-hour	0.081	0.077		0.08 ^c	ppm

a - Not to be exceeded more than once per year

b - Arithmetic mean

c - Not to be exceeded on more than an average of one day per year over a three-year period

6.4 Air Quality Impact Analysis

Significant Impact Analysis

Significant Impact Levels (SILs) are defined for PM/PM₁₀, CO, NO_x and SO₂. A significant impact analysis is performed on each of these pollutants to determine if a project can cause an increase in ground level concentration greater than the SIL for each pollutant.

In order to conduct a significant impact analysis, the applicant uses the proposed project's emissions at worst load conditions as inputs to the models. The models used in this analysis and any required subsequent modeling analyses are described below. The highest predicted short-term concentrations and highest predicted annual averages predicted by this modeling are compared to the appropriate SILs for the PSD Class I Chassahowitzka National Wildlife Refuge (CNWA) and the PSD Class II Area (everywhere except the CNWR).

For the Class II analysis a combination of fence line, near-field and far-field receptors were chosen for predicting maximum concentrations in the vicinity of the project. The fence line receptors consisted of discrete Cartesian receptors spaced at 50-meter intervals around the facility fence line. The remaining receptor grid consisted of densely spaced Cartesian receptors at 100 meters apart starting at the property line and extending out to 10 kilometers.

For the Class I analysis discrete receptors located at the CNWA were used. These receptors represent a subset of receptors provided by the National Park Service.

If this modeling at worst-load conditions shows ground-level increases less than the SILs, the applicant is exempted from conducting any further modeling. If the modeled concentrations from the project exceed the SILs, then additional modeling including emissions from all major facilities or projects in the region (multi-source modeling) is required to determine the proposed project's impacts compared to the AAQS or PSD increments.

The applicant's initial PM/PM₁₀, CO, NO_x, and SO₂ air quality impact analyses for this project indicated that maximum predicted impacts from all pollutants are less than the applicable SILs for the Class II area (i.e. all areas except CNWR). These values are tabulated in the table below and compared with existing ambient air quality measurements from the local ambient monitoring network.

Table 16. Maximum Projected Air Quality Impacts from Hillsborough County RRF Unit 4 Project for Comparison to the PSD Class II Significant Impact Levels

Pollutant	Averaging Time	Max Predicted Impact (ug/m ³)	Significant Impact Level (ug/m ³)	Baseline Concentrations (ug/m ³)	Ambient Air Standards (ug/m ³)	Significant Impact?
SO ₂	Annual	0.1	1	~5	60	NO
	24-Hour	2	5	~55	260	NO
	3-Hour	6	25	~218	1300	NO
PM ₁₀	Annual	0.2	1	~26	50	NO
	24-Hour	0.7	5	~76	150	NO
CO	8-Hour	6	500	~4600	10,000	NO
	1-Hour	12	2000	~4600	40,000	NO
NO ₂	Annual	0.4	1	~15	100	NO

It is obvious that maximum predicted impacts from the project are much less than the respective AAQS and the baseline concentrations in the area. SO₂, PM₁₀, CO and NO_x are also less than the respective significant impact levels that would otherwise require more detailed modeling efforts.

The nearest PSD Class I area is the CNWR located about 78 km to the north of the project site. Maximum air quality impacts from the proposed project are summarized in the following table. The results of the initial PM/PM₁₀, NO_x and SO₂ air quality impact analyses for this project indicated that maximum predicted impacts from SO₂, PM₁₀, and NO₂ are less than the applicable SILs for the Class I area. Therefore no further detailed modeling efforts are required for these pollutants.

Table 17. Maximum Air Quality Impacts from the Hillsborough Resource Recovery Facility Unit 4 Project for comparison to the PSD Class I SILs at CNWR

Pollutant	Averaging Time	Max. Predicted Impact at Class I Area (ug/m ³)	Class I Significant Impact Level (ug/m ³)	Significant Impact?
PM ₁₀	Annual	0.0006	0.2	NO
	24-hour	0.009	0.3	NO
NO ₂	Annual	0.003	0.1	NO
SO ₂	Annual	0.002	0.1	NO
	24-hour	0.03	0.2	NO
	3-hour	0.1	1	NO

Preconstruction Ambient Monitoring Requirements

A preconstruction monitoring analysis is done for those pollutants with listed de minimis impact levels. These are levels, which, if exceeded, would require pre-construction ambient monitoring. For this analysis, as was done for the significant impact analysis, the applicant uses the proposed project's emissions at worst load conditions as inputs to the models. Per the following table, the maximum predicted impacts for all pollutants with listed de minimis impact levels were less than these levels. Thus no pre-construction monitoring is required.

Table 18. Maximum Air Quality Impacts vs. the De Minimis Ambient Impact Levels.

Pollutant	Averaging Time	Max Predicted Impact (ug/m ³)	De Minimis Level (ug/m ³)	Baseline Concentrations (ug/m ³)	Impact Greater Than De Minimis?
PM ₁₀	24-hour	0.7	10	~76	NO
NO ₂	Annual	0.4	14	~15	NO
SO ₂	24-hour	2	13	~55	NO
CO	8-hour	6	575	~4600	NO

There are no ambient standards or *de minimis* air quality levels associated with VOC, which is a precursor for the pollutant ozone. The impacts of VOC and NOx emissions on ozone levels are not usually seen locally, but contribute to regional formation of ozone. Projects with VOC and NOx emissions greater than 100 tons per year are required to perform an ambient impact analysis for ozone including the gathering of preconstruction ambient air quality data. The applicant estimated annual potential VOC and NOx emissions from the project to be 12 and 256 tons per year respectively. Therefore, a preconstruction monitoring analysis for ozone is required.

Based on the preceding discussions, the only additional detailed air quality analyses (inclusive of all sources in the area) required by the PSD regulations for the proposed project is the following:

- A Preconstruction Monitoring and Ambient Air Quality analysis for ozone (NOx);
- An analysis of impacts on soils, vegetation, visibility, and of growth-related air quality modeling impacts.

Models and Meteorological Data Used in the Air Quality Analysis

PSD Class II Area: The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project in the surrounding Class II Area. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. It incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition.

The ISCST3 model allows for the separation of sources, building wake downwash, and various other input/output parameters. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfied the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service at Tampa International Airport. The 5-year period of meteorological data was from 1991 through 1995. This dataset is the most recent available in the electronic format compatible with the ISCST3 model. In general, meteorological data used for modeling provides typical and potential situations that an area experiences over several years. Therefore, datasets that are not current may still produce accurate modeling results. This airport station was selected for use in the study because it is the closest primary weather station to the study area and is most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

In reviewing this permit application, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification should EPA revise the

may affect other actions taken by the source owners or operators. A more detailed discussion of the required analyses follows.

PSD Class I Area: The California Puff (CALPUFF) dispersion model was used to evaluate the pollutant emissions from the proposed project in the Class I CNWR beyond 50 km from the proposed project. Meteorological MM4 and MM5 data used in this model was from 1990, 1992 and 1996.

CALPUFF is a non-steady state, Lagrangian, long-range transport model that incorporates Gaussian puff dispersion algorithms. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, line, area, and volume sources.

The CALPUFF model has the capability to treat time-varying sources, is suitable for modeling domains from tens of meters to hundreds of kilometers, and has mechanisms to handle rough or complex terrain situations. Finally, the CALPUFF model is applicable for inert pollutants as well as pollutants that are subject to linear removal and chemical conversion mechanism.

Preconstruction Monitoring Analysis for Ozone

There are six ozone monitoring sites in Hillsborough County which are all in attainment with the National Ambient Air Quality Standards. The closest monitoring site is directly east of the project site and is representative of the air quality in the vicinity of the project. Therefore, placing a preconstruction monitor at the project site is not needed, nor required to obtain background air quality concentrations.

Ozone

Ozone is an area-wide pollution problem and the solution to reducing ozone levels is broad-based local and regional reductions in NO_x and VOC emissions (the precursors to ozone formation). According to the applicant, in 1999, Hillsborough County had total emissions of NO_x and VOC of 111,237 TPY and 52,205 TPY respectively from industrial and mobile sources. As mentioned in the BACT analysis, there have already been reductions of approximately 40,000 TPY of NO_x from TECO power plants and additional reductions are expected following completion of SCR projects underway at the Big Bend Station.

The Hillsborough Resource Recovery Facility Unit 4 will add at most 256 TPY of NO_x and 12 TPY of VOC that will constitute an insignificant contribution to the regional ozone precursor emissions.

To demonstrate that the 256 tons of NO_x and 12 tons of VOC will not cause or contribute to a violation, a very sophisticated and expensive model would need to be run for the entire region. The key inputs to the model would be traffic, power plants throughout the region, other industrial sources, and meteorology. The uncertainty in any regional ozone model would be greater than the contribution from this project.

6.5 Additional Impacts Analysis

Impact on Soils, Vegetation, and Wildlife:

The project will incorporate a complete air pollution control treatment system consisting of a spray dryer, fabric filter, activated carbon injection system and selective non-catalytic reduction

(SNCR) that will minimize emissions of particulate matter, acid gases, metals, ozone precursors, and hazardous air pollutants including mercury.

The maximum ground-level concentrations predicted to occur for PM₁₀, CO, NO_x, and SO₂ as a result of the proposed project, including background concentrations, will be considerably less than the respective AAQS.

With the high level of pollution control and much less than significant air quality impact, it is reasonable to assume the impacts on soils, vegetation, or wildlife will be minimal or insignificant.

The applicant submitted a section within the Site Certification Application that included an evaluation of the effects of emissions upon aquatic life, the wood stork and the river otter. According to the conclusions from that report, "aquatic and terrestrial wildlife are not predicted to be at risk from adverse effects due to operation of a four-unit Hillsborough County RRF."

As part of the Additional Impact Analysis, Air Quality Related Values (AQRV) are evaluated with respect to the Class I area. This includes the analysis of sulfur and nitrogen deposition. The CALPUFF model is also used in this analysis to produce quantitative impacts. The results of the analysis show that nitrogen and sulfur deposition rates are less than the significant impact levels (0.01 kg/ha/yr) determined by the National Park Service.

The applicant also reviewed nitrogen deposition into Tampa Bay and estimated the contribution from this project at 0.5 TPY. As previously discussed, very substantial reductions in the Tampa Bay area have already occurred. These have already reduced nitrogen deposition into Tampa Bay by a much greater amount than the increases due to Unit 4.

Impact on Visibility:

The applicant submitted a visibility analysis for the CNWR. The analysis included modeling from the CALPUFF model. The National Park Service threshold for visibility percent change in extinction is 5%. The modeling results concluded that the modification may contribute to one day in three years being slightly above 5% (5.43%), which is less than 0.1% of the time. The National Park service has not made any comments regarding this project. Given that the modeling results are based on worst-case scenarios, the likelihood of the worse-case emissions occurring on the one day of meteorology out of three years is unlikely and therefore, will not have an adverse impact on visibility in the CNWR.

Growth-Related Impacts Due to the Proposed Project:

The project is accommodating growth in the area rather than stimulating growth. There will be few new permanent employees or businesses in the area due to the project. Truck traffic will increase due to greater deliveries of MSW, but will offset traffic patterns elsewhere in the County that would otherwise be directed to landfills.

Growth-Related Air Quality Impacts since 1977:

According to the applicant, population growth in the area of the proposed project, Hillsborough County, has increased 42% since 1980. Despite the growth, county-wide air quality has improved in terms of SO₂, NO_x, and PM/PM₁₀ as reported by the County's ambient air monitoring network. The county was redesignated from marginal ozone non-attainment to attainment in the mid-1990's.

There have been reductions of 160,000 and 40,000 TPY of SO₂ and NO_x respectively since 1998 due to the natural gas repowering of the coal-fired TECO Gannon (now Bayside) Station and addition of a scrubber and Low NO_x burners at the TECO Big Bend Station. Both plants were in existence prior to 1977.

Endangered Species Considerations

The purpose of the ESA is to conserve “the ecosystems upon which endangered and threatened species depend” and to conserve and recover listed species.²⁶ Under the law, species may be listed as either “endangered” or “threatened”.

Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened.

While state PSD permits are not generally reviewed for adherence with the Endangered Species Act, the State of Florida’s Power Plant Certification process requires an assessment of existing ecology and determination of project impacts. Appendix 12-1 of Volume II of the Site Certification Application addresses ecology and includes a “Florida Natural Areas Inventory” of rare species compiled by Florida State University’s Institute of Science and Public Affairs.

The compilation includes a review of the potential habitats for rare species within five miles of the site, including sightings of the Eastern Indigo Snake, the Florida Sandhill Crane, Little Blue Heron, Limpkin, Snowy Egret, Bald Eagle, Gopher Tortoise, Roseatte Spoonbill, Short-tailed Snake, Osprey, American Alligator and Wood Stork. As previously mentioned, the effects emissions on the Wood Stork were evaluated by the applicant.

The review includes a summary of rare species and natural communities in the county as well as the legal status (e.g. endangered, threatened, listed, etc.), descriptions of the previously mentioned wildlife, and “Common Plant Communities in Southwest Florida”. The relevant sections of the Site Certification Application with this information are available at the State and local environmental program offices.

Following is a gallery of some of the previously mentioned birds from the Southwest Florida Water Management District’s website at:

www.sfwmd.gov/org/wrp/wrp_evg/2_wrp_evg_info/photos_birds.html



Figure 14. Wood Stork, Snowy Egret, Little Blue Heron, Roseatte Spoonbill, Osprey

According to the U. S. Fish and Wildlife Service (F&WS) website at there were 111 threatened or endangered species (per the federal list) in Florida on May 18, 2004. The reader is referred to the following website: http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?state=FL

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