

TECHNICAL EVALUATION  
AND  
PRELIMINARY DETERMINATION

HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY  
TAMPA, HILLSBOROUGH COUNTY, FLORIDA

Resource Recovery Facility  
Modifications to PSD Permit

PSD-FL-121(C)  
Facility ID No. 0570261

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

May 3, 2000

# TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

## 1. APPLICATION INFORMATION

### 1.1 Applicant Name and Address

Hillsborough County  
601 E. Kennedy  
Tampa, Florida 33602

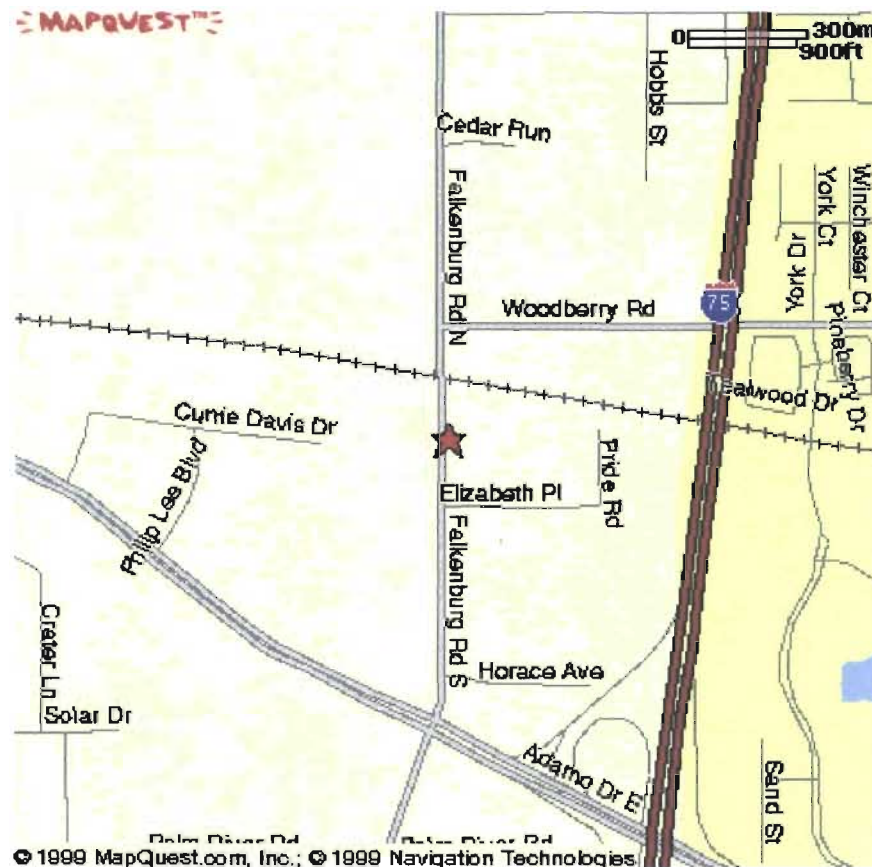
### 1.2 Reviewing and Process Schedule:

04-05-00: Date of receipt of modification request  
04-05-00: Application deemed complete/sufficient  
05-03-00: Issued Intent

## 2. FACILITY INFORMATION

### 2.1 Facility Location

The Hillsborough County Resource Recovery Facility is located at 350 Falkenburg Road in Tampa. This site is between 75 and 100 kilometers from the Chassahowitzka National Wilderness Area, a Class I PSD Area. The UTM coordinates of this facility are Zone 17, 368.20 km East and 3092.70 km North.



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## 2.2 Standard Industrial Classification Codes (SIC)

Major Group No.	49	Electric, Gas and Sanitary Services
Industry Group No.	495	Sanitary Services
Industry Group No.	4953	Refuse Systems

## 2.3 Facility Category

This facility makes electricity by burning solid waste in three furnaces, recovering the heat as steam, and expanding it in a steam electrical generator. The solid waste burned is typically characterized as "refuse such as trash and garbage" or as municipal solid waste (MSW). The facility is permitted to burn up to a maximum of 460 tons per day (400 TPD on an average annualized basis) in each of three units. Certain segregated wastes consisting of materials typically found in MSW are mixed into the waste while maintaining the overall characteristics of the waste within the typical ranges of heat and moisture content as well as emission characteristics. The electricity is sold to Tampa Electric Company.

The facility is classified as a major or Title V source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), or volatile organic compounds (VOC) exceed 100 tons per year (TPY). It is also a major source because emissions of air toxics, such as hydrogen chloride (HCl) or hydrogen fluoride (HF), exceed 10 TPY individually or 25 TPY in the aggregate.

Municipal incinerators are included in the list of the 28 Major Source Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 100 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD).

Per Table 62-212.400-2, modifications at existing major facilities resulting in "Significant Emission Rate" increases greater than: 100 TPY of CO; 40 TPY of NO<sub>x</sub>, VOC, or SO<sub>2</sub>; 25/15 TPY of PM/PM<sub>10</sub>; 7 TPY of sulfuric acid mist (SAM); 0.1 TPY of mercury (Hg); 3 TPY of fluorides (F), or 0.6 TPY of lead (Pb) also require a PSD permit and a BACT determination.

A PSD permit was issued for this facility, including a determination of Best Available Control Technology (BACT), by the United States Environmental Protection Agency (EPA) on July 7, 1986. Modifications to the PSD permit, were issued on October 14, 1987, January 20, 1995 and June 29, 1998.

The modification of June 29, 1998 was to upgrade the air pollution control system to comply with 40CFR60, Subpart Cb - Emission Guideline and Compliance Times for Municipal Waste Combustors That Are Constructed on or Before December 19, 1995.

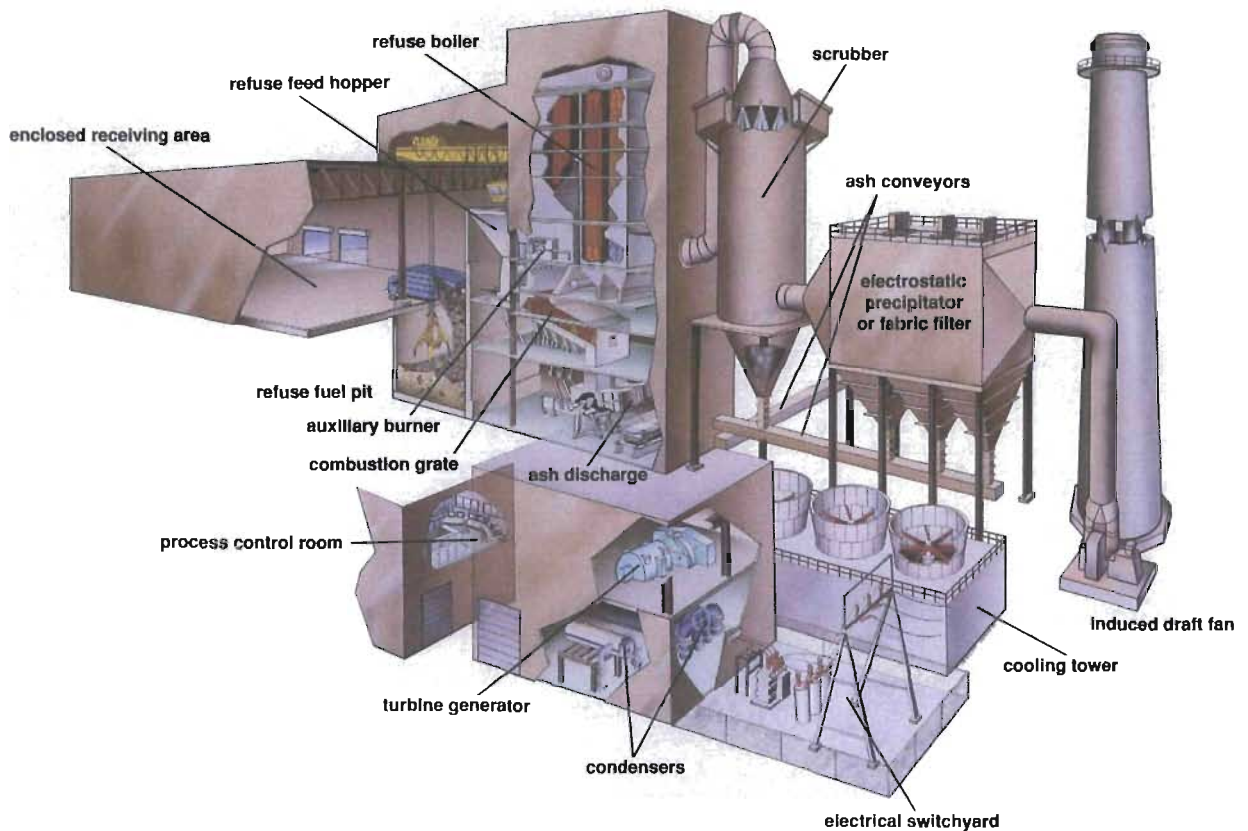
In addition to the physical changes required for the upgrade of the pollution control system, a number of revisions were requested which required modifications of the existing Permit PSD-FL-121 issued on July 7, 1986. These revisions included:

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- Increasing the rated short-term capacity of each unit from 440 to 460 TPD, heat input from 165 to 172.5 million Btu per hour (mmBtu/hr), and setting steam flow at 102,000 pounds per hour (lb/hr).
- Providing for combustion of segregated waste streams and defining more precisely the types of wastes that may be burned.

### 3. PROCESS DESCRIPTION

The facility is a waste-to-energy installation employing mass burning of solid waste, heat recovery as superheated steam, and power generation in a steam electric cycle. Other than landfiling, this is the most common method of solid waste disposal in the United States. There are twelve such facilities in the State of Florida. Following is a description and a diagram of a typical waste-to energy process.



Waste is received via transfer, roll-off, or collection vehicles. Upon arrival, each vehicle is weighed at the scale house and the waste is categorized. Any unacceptable waste is diverted at this time. All acceptable waste is taken to the Refuse Receiving Building, where it is deposited onto the tipping floor or into the Refuse Storage Pit. The refuse is stored at this location until needed to charge the combustion units.

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Charging of the combustion units is accomplished using overhead cranes equipped with "orange peel" grapples. These stack, mix, and relocate waste within the pit and transfer it into the feed hoppers serving each unit. The waste enters the three refuse-fired steam generators, each of which consists of an integrated mass-burn stoker furnace and waterwall boiler. Hydraulically operated feeders push the waste onto "stoker grates". The stoker grates are sloped downward and operate with a reverse-reciprocating action which agitates the burning refuse and moves it along the grates.

Combustion air is drawn from the refuse tipping area (assisting in odor control) and conveyed through the gas side of the air preheater and into the refuse-fired generators where the waste is combusted. Exhaust gases from the refuse-fired generators pass through an economizer unit and are ducted to the air pollution control system that presently consists of an electrostatic precipitator (ESP) but that will be replaced by the system shown in the diagrams. Treated gases are exhausted to the atmosphere through three individual flues within a single 220 foot stack. Bottom ash from the furnaces is removed, quenched and processed for metal recovery and disposal.

The superheated steam enters a single, three-stage turbine where it is expanded. The turbine powers a single 29 megawatt (nameplate rated capacity) electric power generator. The electric power is introduced into the electrical grid and is purchased by Tampa Electric Company. Exhaust steam from the turbine is condensed and the water is cooled in an evaporative cooling tower. Tower blowdown is sent to the sanitary sewer and make-up water to the tower is provided from a sewage treatment plant. Boiler make-up water is provided from the municipal water supply. It undergoes treatment including demineralization. It is transferred to the deaerator, which also receives water from the condensers, air preheaters, and feedwater heaters. Boiler feedwater is provided from the deaerator.

#### 4. PROJECT DESCRIPTION

The County proposed the following revisions to the specific conditions of PSD-FL-121B. The County's requests prepared by Ogden Martin Systems of Hillsborough County (OMSHC) and the Department's responses follows:

##### Subsection A. Facility Description.

*Please reword the permit to read that "the Facility generates electricity, and has an electrical generator capable of generating 32.5 MW for the entire Facility."*

The original application, previous Department technical evaluations, and written statements from OMSHC refer to an electrical generating capacity of 29 MW. Because of the confusion and the fact that the power generating capacity was not given as a permit condition, it will be deleted from the description of the facility. OMSHC provided a picture of the nameplate and a datasheet showing the actual rating as 37.65 MW @0.85 Power Factor. This equates to 32 MW at unity.

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### Page 4, Subsection B.1.

*Please reword the first sentence that: "the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application." It is respectfully requested that the permit be revised to state: "Unless otherwise indicated in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and design specifications stated in the application. Operation of the facility shall be in accordance with the emission limits specified in this permit."*

The Department will modify this condition to exclude the word capacities and operation as stated above since this permit is for the installation/upgrading of the new control equipment and did not change the capacities or operation of the units. The permit solely clarified those capacities.

### Page 6, Subsection A.

*As stated in our January 11, 2000 comment letter on the draft Title V permit, the regulatory language in 40 CFR 61, Subpart C indicates that the beryllium NESHAPS is not applicable to this facility. The Hillsborough County WTE facility does not accept any of the beryllium-containing wastes listed in the rule. It is our understanding that only incinerators that accept beryllium-containing waste generated by those source categories are affected by the rule. Therefore, we respectfully request deletion of all permit references to beryllium including emissions limits and testing requirements (Section III, Subsection B.8 on Page 12; page 42, Subsection C.29; Table 2-1).*

References to the 40 CFR 61, Subpart C, National Emissions Standards for Beryllium, will be deleted from the permit since the County has assured the Department that they do not accept "beryllium containing waste." EPA determined that 40 CFR 61, Subpart C is not applicable to municipal solid waste incinerators (MSWI) unless the MSWI burns "beryllium containing waste" as defined in the 40 CFR 61, Subpart C. However, the Department will not remove the Be limits as discussed below.

On page 14 of the Technical Evaluation and Preliminary Determination (TEPD) dated January 27, 1998, the Department stated: "Based on the results of the previous testing and the installation of control equipment, the Department expects Be emissions to remain below PSD significant levels and probably below detectable levels. However, a comparison of past actual to future potential emissions still results in a PSD-significant increase in Be emissions. The County will need to make demonstrations a PSD-significant increase did not occur by reporting future representative actual annual emissions."

Furthermore, in the Final Determination dated June 29, 1998, the Department stated: ".....annual test requirements for Be and F (the test results will be evaluated for at least a 5 year period), for the reasons stated in the Technical Evaluation (refer to sections 7 and 8 of this technical evaluation)". Therefore, the Be emission limits will not be deleted at this time. This is a BACT requirement of the original permit. As explained in the Final Determination, the Department will evaluate the facility Be test results (for at least a 5 years period) prior to considering the County request to delete this limit.

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### Page 7, Subsection B. Specific Conditions, Permitting Note.

*This requests that the "shall not be exceeded" language regarding net steam energy either be deleted entirely or rephrased to indicate that "The facility has a design net steam energy of 1158 Btu/lb". Net steam energy is not a defined regulatory term under Federal Subpart Cb regulations or State regulations. Unlike steam load or boiler feedwater, net steam energy is a calculated value and cannot be monitored on a real time basis. CDM's January 9, 1999 letter to FDEP presented sample calculations with assumptions designed to illustrate the relationship between steam flow and heat input – not as a proposed "not to exceed" value or operations limit. CDM's sample calculation included boiler design values for steam enthalpy (1378.86 Btu/lb) and feedwater enthalpy (220.82 Btu/lb).*

The Department will revise the language in the permit permitting note to read that the facility has a design net steam energy of 1158 Btu/lb (1378.86Btu/lb steam enthalpy - 220.82 Btu/lb feedwater enthalpy).

### Page 7, Subsection B.2 (a)

*Please delete reference to "172.5 MMBtu per hour" as a maximum operating rate. The relationship between heat input, steam load and MSW throughput was clearly documented in CDM's 1997 application. Heat input is not directly measurable and is redundant to other, more direct, measurements of processing rates that limit MSW processing capacity. Since this value is not directly measurable, it is not practicably enforceable and it is respectfully requested that it be deleted as an operational limitation.*

The Department will delete this reference since it is already stated as a permitting note and it was not included in the original PSD permit as a permit condition. We concur that this issue (heat input, steam load and MSW throughput relationship) was documented in the application and explained at length in the Technical Evaluation & Preliminary Determination dated January 27, 1998. It is a fact that each unit has a nominal heat input of 150 mmBtu/hr and a maximum heat input of 172.5 mmBtu/hr. These values although not directly measured can be easily calculated. By letter dated March 17, 1998, D.B Riley, Inc. (boilers' manufacturer) indicated that it performed an evaluation of each boiler's ability to operate at the proposed increase steam flow of 102,000 lb steam/hr and concluded that each boiler can safely operate at an increased continuous steam generation rate of 103,700 lb steam/hr. The maximum steam load recommended by the manufacturer shall not be exceeded. The Department acknowledges that 40 CFR Subpart Cb regulates only steam load.

### Page 7, Subsection B.2 (b)

*Please delete the combustion efficiency (CE) requirement; it was not requested by CDM in its construction permit application. CE is not a regulatory requirement under either federal Subpart Cb standard or applicable State regulations. CO is a surrogate for measuring combustion efficiency and Subpart Cb requires continuous CO monitoring. In that context, inclusion of CE in this permit is obsolete and redundant. Since Subpart Cb requires substantial reduction of carbon monoxide relative to prior PSD limits – along with installation of a continuous emissions monitor (CEMS) for CO, the new CO limit and*



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*CEMS equipment are more than adequate to document ongoing compliance with federal/state good combustion practice requirements.*

The Department accepts the County rationale and deletes this condition from permit PSD-FL-121B

Page 10, Section III, B.6.6, B.6.7; and B.25 (page 21).

*Please substitute "monthly average" for 30 day rolling average calculation of segregated waste since normal facility recordkeeping procedures are done on a calendar month basis (and amend condition B.25 accordingly). The imposition of a 30-day rolling average requirement requires daily calculation of this value and imposes an unnecessarily burdensome additional recordkeeping requirement. A monthly block average eliminates added recordkeeping time/cost.*

This condition will be changed to read "on a calendar month basis". The Department accepts the County rationale.

Page 11, Section III, B.6.

*With respect to segregated wastes, Mr. Drew Lehman of Ogden and Mr. Joseph Kahn of FDEP recently spoke by telephone about the Department's intent in listing specific approved waste streams in the permit. Mr. Kahn indicated that the intent is that no further Department approval will be needed for those wastes. It would be very helpful if the amended PSD permit contain a clarifying statement to the effect that "Waste materials specifically authorized above do not require Department approval ". While DEP's approval is implicit in the permit as currently worded, an explicit statement will be most appreciated to minimize potential confusion and future questions on this point of regulatory intent.*

The statement "Waste materials specifically authorized above do not require Department approval", will be added after subsections (a) through (g) of Specific Condition B.6.7. However, waste materials that require approval listed in subsection (h) will remain unchanged, this is:

- (h) 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.

Page 12, Section III, B.8.

*It is requested that this Table of emission limits be revised as follows. Please delete the lb/MMBtu and lb/hr columns since they are derived directly from and therefore wholly redundant to the tons per year (TPY) column. The TPY values in the permit are based upon and consistent with emission factor estimates in CDM's 1997 application. The TPY values were developed for the application using CDM's theoretical, proprietary "BURN" model calculation and presented as part of CDM's "netting" and air quality modeling analyses - not as not-to-exceed permit limits.*

The Department will revise this Table to indicate that the emission limits on lb/hr, lb/mmBtu, TPY are referenced as equivalent emissions. These equivalent emissions limits are listed for



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the purposes of providing information on the potential to emit, to be use in future PSD applicability determinations, to determine short-term emissions limits, to be used in the Department database and to assess Title V fees. In the case of the municipal solid waste combustors, compliance should be demonstrated in units of the standard, this is 40 CFR 60, Subpart Cb units.

*Sulfuric acid mist. The limit for and testing of sulfuric acid mist was specifically eliminated via PSD-FL-121 (A). The Department's January 27, 1998 Technical Evaluation and Preliminary Determination report noted that "the (H<sub>2</sub>SO<sub>4</sub>) limit appears to have been deleted instead " (page 8). That report also states that "injection of ammonia or urea for NO<sub>x</sub> control will further suppress SAM emissions and possibly interfere with their measurement." Since this permit condition was formally eliminated via a prior PSD permit change, and recognizing the potential for test interference, it is respectfully requested that all references to an H<sub>2</sub>SO<sub>4</sub> limit and all requirements for testing be eliminated from the permit (i.e. Table B.8, Section III, B.9 and Method 8 reference)*

The sulfuric acid mist (SAM) emission limit will not be deleted. The Department already determined that an initial test is required as stated in the TEPD and Final Determination issued in 1998. The protocol and method should be submitted to the Department as stated in the Technical Evaluation and Preliminary Determination (TEPD). Specific Conditions that refer to SAM emissions will not be modified.

Page 16, Subsection B.17 (a)

*This request that the deadline for the annual report documenting compliance with the 10% annual fuel capacity factor limitation be extended to 60 days after the end of the calendar year. This is a professional courtesy to allow sufficient time to compile information given a typical crush of end-of-year data compilations.*

The Department accepts the County rationale and changes this condition as requested.

Page 17, Subsection B.18.

*Technically, steam production, baghouse inlet temperature measurement, carbon injection system, and power generation monitors are not "CEMS" in the sense of gaseous pollutants. There are no federal (40 CFR 60 Appendix B & F) or State calibration and maintenance requirements for these devices. Please rephrase the permit to indicate that: "These operational data monitoring systems shall be calibrated annually and operated in accordance with good engineering practice."*

The Department accepts the County rationale and changes this condition as requested.

Page 18, Subsection B. 20.

*Typo in second line, change to "the following date".*

The Department accepts the County observation and changes this condition as requested.

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## 5. RULE APPLICABILITY

This change constitutes a minor modification of PSD permit number PSD-FL-112B. Therefore the modification is not subject to review under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD), so neither a revised Best Available Control Technology (BACT) determination nor an analysis of the air quality impact is required. However, because this project requires a modification of a PSD permit, the public notice requirements for PSD permits are applicable.

The facility is located in an area (Hillsborough County) designated "unclassifiable" for SO<sub>2</sub>, "maintenance" for Ozone (O<sub>3</sub>), PM, and lead (Pb), and "attainment" for all the other criteria pollutants (Rule 62-204.360, F.A.C.). One of the requirements under the maintenance plan for the area is implementation of Reasonable Available Control Technology (RACT) pursuant to Rule 62-296.711, F.A.C. The Department previously found that the requirements of permit number PSD-FL-112B constitute RACT for particulate matter, pursuant to Rule 62-296.711(2)(c), F.A.C. This project will not change these requirements.

The facility shall comply with all applicable requirements of Chapter 403, Florida Statutes, and Chapters 62-4, 62-17, 62-204, 62-210, 62-212, 62-214, 62-256, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility shall comply with all applicable provisions of the federal regulations including but not limited to: 40 CFR 60 Subpart Cb Emissions Guidelines and Compliance Times for Existing Municipal Waste Combustors Constructed on or Before December 19, 1995; 40 CFR 51 Subpart P, Protection of Visibility; 40 CFR 52.21 Prevention of Significant Deterioration; 40 CFR 60, Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units; 40 CFR 60, Subpart E, Standards of Performance for Incinerators; 40 CFR 60, Subpart A, General Provisions; 40 CFR 64, Compliance Assurance Monitoring; 40 CFR 50, National Primary and Secondary Ambient Air Quality Standards.

This facility is also subject to all applicable requirements related to used fuels and wastes given in 40 CFR 279 and 40 CFR 261 (July 1999 version), which are adopted by reference in Chapters 62-710 and 730, F.A.C.

## 6. CONTROL TECHNOLOGY ASSESSMENT

The control technology for this facility and the reasonably available control technology (RACT) were discussed in the Technical Evaluation and Preliminary Determination of January 27, 1998.

## 7. CONCLUSION

Based on the technical evaluation of the request, the Department has reasonable assurance that the project will comply with all applicable state and federal air pollution regulations provided the allowable emissions limits are not exceeded and certain conditions are met. The modified specific conditions are listed in the attached draft conditions of approval.

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For further details regarding this review, contact:

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