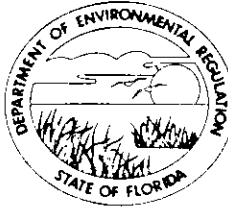


STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM  
GOVERNOR

VICTORIA J. TSCHINKEL  
SECRETARY

August 15, 1986

CERTIFIED MAIL-RETURN RECEIPT REQUESTED


Mr. Walt Walters  
President  
NRG/Recovery Group  
1616 Athens Street  
Lakeland, Florida 33802

Dear Mr. Walters:

Attached is one copy of the Technical Evaluation and Preliminary Determination, and proposed permit to construct a 500 ton per day municipal solid waste energy recovery facility in Lake County, Florida.

Please submit, in writing, any comments which you wish to have considered concerning the department's proposed action to Mr. Bill Thomas of the Bureau of Air Quality Management.

Sincerely,

  
C. H. Farcy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

CHF/pa

Attachments

cc: C. P. Nichols, P.E.  
Tom Sawicki  
Bruce Miller  
Mark Scruggs

PS Form 3811, July 1983 447-845

**SENDER** Complete items 1, 2, 3 and 4.  
 Put your address in the "RETURN TO" space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for service(s) requested.

1.  Show to whom, date and address of delivery  
 2.  Restricted Delivery

3. Article Addressed to  
 Mr. Walt Walters  
 NRG/Recovery Group  
 1616 Athens Street  
 Lakeland, FL 33801

DER  
 AUG 20 1986  
 BAQMM

4. Type of Service:      Article Number

Registered     Insured  
 Certified     COD  
 Express Mail

PA 408 532 091

Always obtain signature of addressee or agent and  
**DATE DELIVERED.**

5. Signature - Addressee  
 X *Walt Walters*

6. Signature - Agent  
 X

7. Date of Delivery  
*8-18-86*

8. Addressee's Address (ONLY if requested and fee paid)

DOMESTIC RETURN RECEIPT

P 408 532 091

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED - NOT FOR INTERNATIONAL MAIL

(See Reverse)

Sent to	
Mr. Walt Walters	
Street and No.	
P.O., State and ZIP Code	
Postage	\$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to whom and Date Delivered	
Return Receipt Showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	\$
Postmark or Date	

8/15/86

PS Form 3840, Feb. 1982

State of Florida  
 Department of Environmental Regulation  
 Notice of Proposed Agency Action  
 on Permit Application

The Department of Environmental Regulation gives notice of its intent to issue a permit to NRG/Recovery Group to construct two 250 ton per day incinerators that will burn municipal solid waste and wood chips. The project will be located on Jim Rogers Road, Okahumpka, Lake County, Florida. A determination of best available control technology (BACT) was required. Electrostatic precipitators were determined to represent BACT for this facility. However, the department has initiated rulemaking for municipal solid waste incinerators which could ultimately result in more stringent air emission limitations. Space will be provided to allow for the retrofit of additional air pollution control equipment, as may be required by rule.

This application was reviewed under Florida Administrative Code Rule 17-2.500, Prevention of Significant Deterioration. Emissions of air pollutants, in tons per year, will increase by the following amounts:

<u>PM</u>	<u>SO<sub>2</sub></u>	<u>NO<sub>x</sub></u>	<u>CO</u>	<u>VOC</u>	<u>Pb</u>	<u>Fl</u>	<u>Be</u>
60	256	456	412	37	1.5	5.5	9.2 x E-5

The maximum percentages of allowable PSD increments consumed by the proposed project will be as follows:

	<u>Annual</u>	<u>24-Hour</u>	<u>3-Hour</u>
<u>Class I</u>			
PM	<20	<10	N/A
SO <sub>2</sub>	<<50	20	16
<u>Class II</u>			
PM	<5	5	N/A
SO <sub>2</sub>	5	23	10

Persons whose substantial interests are affected by the department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must conform to the requirements of Chapters 17-103 and 28-5, Florida Administrative Code, and must be filed (received) in the Office of General

Counsel of the Department at 2600 Blair Stone Road, Twin Towers Office Building, Tallahassee, Florida 32301, within fourteen (14) days of publication of this notice. Failure to file a request for hearing within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this preliminary statement. Therefore, persons who may not object to the proposed agency action may wish to intervene in the proceeding. A petition for intervention must be filed pursuant to Model Rule 28-5.207 at least five (5) days before the final hearing and be filed with the hearing officer if one has been assigned at the Division of Administrative Hearings, Department of Administration, 2009, Apalachee Parkway, Tallahassee, Florida 32301. If no hearing officer has been assigned, the petition is to be filed with the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, Florida Statutes.

The application 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 Regulation  
St. Johns River District  
3319 Maguire Blvd., Suite 232  
Orlando, Florida 32803

Dept. of Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32301

Leesburg Library  
204 N. 5th Street  
Leesburg, Florida

Any person may send written comments on the proposed action to Mr. Bill Thomas at the department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the department's final determination.

BEFORE THE STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of  
Application for Permit by:

NRG/Recovery Group  
1616 Athens Street  
Lakeland, Florida 33803

---

DER File No. AC 35-115379  
PSD-FL-113

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, NRG/Recovery Group, applied on March 18, 1986, to the Department of Environmental Regulation for a permit to construct two 250 ton per day incinerators that will burn municipal solid waste and wood chips. The project will be located on Jim Rogers Road, Okahumpka, Lake County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes and Florida Administrative Code Rules 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit was needed for the proposed work.

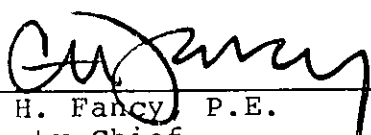
Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, FAC, you (the applicant) are required to publish at your own expense the enclosed Notice of Proposed Agency Action on permit application. The notice must be published one time only in a section of a major local newspaper of general circulation in the county in which the project is located and within thirty (30) days from receipt of this intent. Proof of publication must be provided to the Department within seven days of publication of

the notice. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S. A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. Petitions must comply with the requirement of Florida Administrative Code Rules 17-103.155 and 28-5.201 (copies enclosed) and be filed with (received by) the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32301-8241. Petitions filed by the permit applicant must be filed within fourteen (14) days of receipt of this intent. Petitions filed by other persons must be filed within fourteen (14) days of publication of the public notice or within fourteen (14) days of receipt of this intent, whichever first occurs. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes, concerning the subject permit application. Petitions which are not filed in accordance with the above provisions will be dismissed.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL REGULATION

  
\_\_\_\_\_  
C. H. Fancy, P.E.  
Deputy Chief  
Bureau of Air Quality  
Management

Copies furnished to:

Walt Walters  
C. P. Nichols, P.E.  
Tom Sawicki  
Bruce Miller  
Mark Scruggs

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on August 15, 1986.

FILING AND ACKNOWLEDGEMENT  
FILED, on this date, pursuant to  
§120.52(9), Florida Statutes, with  
the designated Department Clerk,  
receipt of which is hereby  
acknowledged.

Patricia G. Adams August 15, 1986  
Clerk Date

RULES OF THE ADMINISTRATIVE COMMISSION  
MODEL RULES OF PROCEDURE  
CHAPTER 28-5  
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

- (1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.
- (2) All petitions filed under these rules should contain:
  - (a) The name and address of each agency affected and each agency's file or identification number, if known;
  - (b) The name and address of the petitioner or petitioners;
  - (c) All disputed issues of material fact. If there are none, the petition must so indicate;
  - (d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;
  - (e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;
  - (f) A demand for the relief to which the petitioner deems himself entitled; and
  - (g) Such other information which the petitioner contends is material.



**DER1985 RULES OF ADMINISTRATIVE PROCEDURE - NON-RULEMAKING 17-103**

of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32301. Failure to petition to intervene within the allowed time frame constitutes a waiver of any right such person has to an administrative determination (hearing) under Section 120.57, F.S.

(4) Notice to substantially affected persons concerning applications for Department permits is an essential and integral part of the state environmental licensing process. Therefore, no application for a permit for which publication of notice is required shall be granted until and unless proof of publication of Notice is furnished to the appropriate Department permitting office.

(5)(a) Any applicant or person benefiting from the Department's action may elect to publish notice of proposed agency action in the manner provided by subsection (2) or (3). Any person who elects to publish notice of proposed agency action, upon presentation of proof of publication to the Department, prior to final agency action, shall be entitled to the same benefits under this rule as a person who is required to publish notice of proposed agency action. Since persons whose substantial interests are affected by a Department decision on a permit application may petition for an administrative proceeding within fourteen (14) days after receipt of notice and since, unless notice is given or published as prescribed in this rule, receipt of notice can occur at any time, the applicant or persons benefiting from the Department's action cannot justifiably rely on the finality of

the Department's decision without the notice having been duly given or published.

(b) The notices required by this rule may be combined with other notices required by the Department pursuant to Chapter 403, 376, or 253, F.S., or Chapter 17, FAC.

(c) The provisions of this section shall also apply to the permitting of hazardous waste facilities, but only to the extent it is consistent with Chapter 17-30, Part IV, FAC. Whenever Chapter 17-30, Part IV, FAC, provides for a different time or notice procedure than that set forth in this section the time and notice provisions of Chapter 17-30 shall govern.

(6) Failure to publish any notice of application, notice of proposed agency action, or notice of agency action required by the Department shall be an independent basis for the denial of a permit. Specific Authority: 120.53, 403.0876, 403.815, F.S. Law Implemented: 120.53, F.S. History: New 9-20-79, Amended 4-28-81, Transferred from 17-1.62 and Amended 6-1-84.

**17-103.155 Petition for Administrative Hearing; Waiver of Right to Administrative Proceeding.**

(1)(a) Any person whose substantial interests may be affected by proposed or final agency action may file a petition for administrative proceeding. A petition shall be in the form required by this Chapter and Chapter 28-5, FAC, and shall be filed (received) in the Office of General Counsel of the Department within fourteen (14) days of receipt of notice of proposed agency action or within fourteen (14) days of receipt of notice of

17-103.150(3)(d) -- 17-103.155(1)(a)

**DER1985 RULES OF ADMINISTRATIVE PROCEDURE - NON-RULEMAKING 17-103**

agency action whenever there is no public notice of proposed agency action. In addition to the requirements of Rule 28-5.201, FAC, the Petition must specify the county in which the project is or will be located.

(h) Failure to file a petition within fourteen (14) days of receipt of notice of agency action or fourteen (14) days of receipt of notice of proposed agency action, whichever notice first occurs, shall constitute a waiver of any right to request an administrative proceeding under Chapter 120, F.S.

(c) When there has been no publication of notice of agency action or notice of proposed agency action as prescribed in Rule 17-103.150, FAC, a person who has actual knowledge of the agency action or has knowledge which would lead a reasonable person to conclude that the Department has taken final agency action, has a duty to make further inquiry within fourteen (14) days of obtaining such knowledge by contacting the Department to ascertain whether action has occurred. The Department shall upon receipt of such an inquiry, if agency action has occurred, promptly provide the person with notice as prescribed by Rule 17-103.150, FAC. Failure of the person to make inquiry with the Department within fourteen (14) days after obtaining such knowledge may estop the person from obtaining an administrative proceeding on the agency action.

(2)(a) "Receipt of notice of agency action" means receipt of written notice of final agency action, as prescribed by Department rule, or the publication, pursuant to Department rule, of notice of final agency action, whichever first

occurs.

(b) "Receipt of notice of proposed agency action" means receipt of written notice (such as a letter of intent) that the Department proposes to take certain action, or the publication pursuant to Department rule of notice of proposed agency action, whichever first occurs.

(3) Notwithstanding any other provision in this Chapter, should a substantially affected person who fails to timely request a hearing under Section 120.57, F.S., administratively appeal the final Department action or order, the record on appeal should be limited to:

(a) the application, and accompanying documentation submitted by the applicant prior to the issuance of the agency's intent to issue or deny the requested permit.

(b) the materials and information relied upon by the agency in determining the final agency action or order;

(c) any notices issued or published; and

(d) the final agency action or order entered concerning the permit application.

(4) In such cases where persons do not timely exercise their rights accorded by Section 120.57(1), Florida Statutes, the allegations of fact contained in or incorporated by the final agency action shall be deemed uncontested and true, and appellants may not dispute the truth of such allegations upon subsequent appeal.

(5) Any applicant may challenge the Department's request for additional information by filing with the Office of General Counsel an appropriate petition for administrative proceeding pursuant to Section 120.60, F.S., following receipt by

DER1985 RULES OF ADMINISTRATIVE PROCEDURE - NON-RULEMAKING 17-103

the applicant of the Department's notification, pursuant to Section 403.0876, F.S., that additional information is required.

Specific Authority: 120.53,

403.0876, 403.815, F.S. Law

Implemented: 120.53, F.S.

History: New 9-20-79, Amended 4-28-81, Transferred from 17-1.62 and Amended 6-1-84.

**17-103.160 Uniformity in Approval and Denial of Applications for Department Permits and Certifications.** To the extent possible and consistent with the public interest, the Department approves and denies applications for permits and certifications on a uniform and consistent basis. Final Department actions on applications for permits and certifications shall be consistent with prior Department actions, unless deviation therefrom is explained by the Department in writing or the hearing officer who submits a recommended order to the Department for final agency action in accordance with Section 120.57, Florida Statutes.

Specific Authority: 120.53(1), F.S. Law Implemented: 120.53(1), 120.68(12), F.S. History: New 2-6-78, Transferred from 17-1.63, 6-1-84.

**17-103.170 Designation, Preparation and Transmittal of Record for Administrative Appeals.**

When any Department action or order is the subject of an administrative appeal under Chapter 17-103, Part II, FAC, the following requirements shall apply:

(1) Designation of Record. Within fifteen (15) days of rendition of the Department's final order, the appellant shall designate

to the Department, in writing, with copies to other parties, those documents or things under the control of or in the possession of the Department which the appellant desires to have included in the record, and which were received or considered in the Department proceeding below. If a proceeding was reported by mechanical recording devices, the appellant shall designate those portions of the proceeding for which it requires written transcription or tapes for transcription. Any other party may designate other portions of the record in the manner provided herein. Such cross-designation shall be filed with the Department, with copies provided other parties, within seven (7) days after receipt of the designation by the appellant.

(2) Original Record. The Department shall thereupon include in the record all of the designated portions of the original papers and exhibits in the proceedings or matter from which administrative appeal is taken, together with a copy of any such parts of the proceedings as were stenographically reported or transcribed from tapes, and as have been designated by the parties and certified by a notary public, the reporter, or other officer for inclusion in the record on appeal or review, and certified copies of the order, if any, of which review is sought. The Department may, at its discretion, substitute certified copies for original papers or documents in its possession.

(3) Preparation of Record. Upon tender or deposit by appellant of the estimated cost of preparation, the Department shall prepare the record in accordance with the designations of the parties. The cost of preparation, and reproduction,

Technical Evaluation  
and  
Preliminary Determination

Lake County Waste to Energy Facility  
Lake County  
Okahumpka, Florida

Waste to Energy Units 1 and 2

Permit Numbers: AC 35-115379  
PSD-FL-113

Florida Department of Environmental Regulation  
Bureau of Air Quality Management  
Central Air Permitting

August 15, 1986

I. Project Description

A. Applicant

NRG/Recovery Group  
1616 Athens Street  
Lakeland, Florida 33803

B. Project

The applicant proposes to construct two 250 tons per day municipal solid waste fired incinerators which will generate steam and produce approximately 12.3 megawatts of electricity. The proposed waste recovery facility will be located on Jim Rogers Road, Okahumpka, Lake County, Florida. The universal transverse mercator coordinates of the source are: Zone 17, 413.1 km East and 3179.3 km North.

C. Sources Reviewed

This application has been submitted for the following source:

<u>Source</u>	<u>Permit Number</u>
Waste to Energy Units 1 and 2	AC 35-115379

D. Standard Industrial Classification Code (SIC)

The facility is classified as:

Major Group No. 49: Electric, Gas, and Sanitary Services  
Industry No. 4953: Municipal Incineration

E. Facility Category

The Lake County Waste to Energy Facility is classified as a major emitting facility for the air pollutants sulfur dioxide, nitrogen oxides, and carbon monoxide.

F. Application Completeness Date

- (i) Application Received: March 18, 1986.
- (ii) Application Deemed Complete: March 18, 1986.

G. Process and Controls

Waste will be received from municipal and/or contractor trucks principally on a five day a week basis. Trucks will be routed to an enclosed waste pit with multiple unloading bays. The waste pit will have approximately four days storage volume (1800 tons). Overhead cranes with grapple feeders will

distribute the waste to the combustion equipment. Combustion air fans will take suction from the enclosed unloading and waste pit area to aid in ventilation and provide odor control.

The waste will be distributed to two boilers for combustion and generation of steam. The combustion system for each boiler will consist of a waste hopper, hydraulic ram feeder and reciprocating grates. The combustion process will be controlled by modulating feed rate, reciprocating grates, undergrate combustion air and overfire air. Furnace draft will be controlled by modulating inlet dampers to the induced draft fan.

The fuel supply will be Lake County MSW supplemented with up to twenty-five percent of total heat input with wood chips having a heat value of 4,500 Btu/lb at fifty percent moisture content. The total daily input of combined fuels per unit shall not exceed the total heat input from 250 TPD of 5,000 Btu/lb MSW only. The intent is to utilize wood only at times when there is a deficiency of MSW.

Each furnace shall have a gross heat liberation rate not to exceed 10,000 Btu/cu. ft. to insure maximum destruction of volatile organic components and minimum products of incomplete combustion.

Each steam generator shall be of the water tube type. Normal steam flow per unit shall be 60,000 lb/hr net (at 250 TPD of MSW). Steam conditions shall be 650 PSIG and 755°F with a feedwater temperature of 228°F.

The steam from the two boilers will be used to generate power with a single extraction-condensing turbine generator having a nominal capacity of 12.3 megawatts.

The allowable emission rates will be determined by Best Available Control Technology. Particulate emissions were proposed by the applicant to be controlled by a three field electrostatic precipitator (ESP) serving each boiler. Each induced draft fan will discharge to a free standing stack 125 feet in height.

## II. Rule Applicability

Emissions from the proposed Lake County Waste to Energy Facility will consist of particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, lead, mercury, beryllium, fluoride, sulfuric acid mist, and hydrogen chloride.

The proposed project will be located in Lake County. Lake County is designated attainment for all pollutants, FAC Rule 17-2.420.

The proposed project is subject to the federal New Source Performance Standards, Subpart E, Standards of Performance of Incinerators, 40 CFR 60.

The project is also subject to the New Source Review provisions of FAC Rule 17-2.500, Prevention of Significant Deterioration. The project is classified as a new major facility for the pollutants sulfur dioxide, nitrogen oxides, and carbon monoxide, FAC Rule 17-2.500(2)(d)2.b. In addition, the proposed emissions of particulate matter, lead, fluorides, and mercury, are above the Significant Emission Rates listed in Table 500-2 of FAC Rule 17-2.500. The allowable emissions of the major and significant air pollutants will be determined by Best Available Control Technology (BACT).

### III. Summary of Emissions and Air Quality Analysis

#### A. Emission Limitations

The proposed Lake County Waste to Energy Facility will consist of two 250 ton per day incinerators which will be fueled by municipal solid waste and wood chips. The wood chips will only be used to supplement the lack of municipal solid waste. The total heat input will not exceed 104.2 MMBtu per hour for each incinerator. The BACT emission limits for the proposed units and the entire facility are summarized as follows:

	Unit 1 or Unit 2			Facility Total ton/yr
	lb/ton	lb/hr	ton/yr	
*Particulate Matter	0.45	4.7	20.6	41.2
*Sulfur Dioxide	2.8	29.2	127.9	255.8
Nitrogen Oxide	5.0	52.1	228.2	456.4
*Carbon Monoxide	4.5	46.9	205.4	410.8
Volatile Organics	0.40	4.2	18.4	36.8
Lead	0.010	0.1	0.5	0.9
Beryllium	1.0xE-6	10.4xE-6	4.6xE-5	9.2xE-5
Fluoride	0.060	0.63	2.8	5.6
Sulfuric Acid Mist	0.040	0.42	1.8	3.6

\*Particulate Matter based on 0.020 grains/dscf, Sulfur Dioxide shown is a 30 day rolling average not to exceed 5.6 lb/ton per hour, Carbon Monoxide based on 400 ppm<sub>v</sub> at 12% CO<sub>2</sub> 8 hour average.

In addition, mercury emissions from the entire facility are limited to 3200 grams per day. Visible emissions are limited to 15% opacity, maximum six minute average.

## B. Air Quality Analysis

### Prevention of Significant Deterioration (PSD)

#### I. Introduction

The NRG/Recovery Group of Lakeland, Florida (the applicant) is proposing to construct a waste-to-energy resource recovery facility to be located near Leesburg, Florida, in Lake County. The facility will include two waterwall incinerator/boiler units, each having a capacity to incinerate 250 tons of municipal solid waste (MSW) per day. Up to 25 percent of the total heat input may be derived from wood chips when there is a deficiency of MSW. The operation of these units will result in significant emissions of regulated air pollutants and thus must be reviewed by the department.

The NRG facility will be located in a Class II PSD area. This area is also classified as an attainment area for all criteria pollutants. The pollutant emissions estimated by the applicant indicate that the proposed facility is a major facility (i.e., emits greater than 100 TPY of a regulated pollutant) and emits in PSD-significant amounts the following seven pollutants: sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM), carbon monoxide (CO), lead (Pb), mercury (Hg), and fluorides (F<sup>-</sup>). The air quality impact analysis required by the PSD regulations for the subject pollutants includes:

- An analysis of existing air quality;
- A PSD increment analysis (for SO<sub>2</sub> and PM only);
- An Ambient Air Quality Standards (AAQS) analysis;
- An analysis of impacts on soils, vegetation, visibility, and growth-related air quality impacts; and
- A "Good Engineering Practice" (GEP) stack height determination.

Many other pollutants (aside from those specifically regulated by the PSD regulations) will also be emitted into the ambient air by the proposed facility. Some of these have become issues of public concern, such as hydrochloric acid (HCl), dioxins (2,3, 7,8,-TCDD), and various heavy metals. The emission rates and the health and environmental impacts of these pollutants are not clearly understood at this time. The applicant has specifically addressed HCl and estimates of its ambient impact are quantified in this report. Control of HCl and other non-PSD regulated pollutants is discussed in the control technology section of this report.

The analysis of existing air quality generally relies on preconstruction monitoring data collected in accordance with EPA-approved methods. The PSD increment and AAQS analysis



depends on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on these required analyses, the department has reasonable assurance that the proposed facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any PSD increment or ambient air quality standard. In addition, the department has evaluated, to the extent possible, the ambient impacts of several non-PSD regulated pollutants.

## II. Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) atmospheric dispersion model was used for the impact analysis. This model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, or volume-type sources. It incorporates elements for plume rise, transport by the mean wind, and Gaussian dispersion. In addition, the model allows for the separation of sources, building wake downwash, and various other input and output features. The applicant has added to their standard version of the ISCST model a calm winds processor, to adjust concentration averages for calm wind conditions in accordance with EPA guidelines.

Five years of sequential hourly meteorological data were used in the modeling analysis. The surface data used were National Weather Service (NWS) data collected at the Orlando airport during the period 1974-1978. The upper air data for this same period were collected at the upper air station in Tampa. Since five years of data were used, the highest, second-high short-term predicted concentrations are compared with appropriate ambient standards or PSD increments. For the annual averages the highest predicted yearly average was compared to the standards.

The concentration predicted for any particular pollutant in the ISCST model is directly proportional to its emission rate. Because of this proportionality only one set of model runs need to be completed, using an arbitrary emission rate. The concentration predicted for a particular pollutant is calculated by ratioing its emission rate to the rate used in the model and then multiplying this ratio times the modeled concentration. The emission rate used for each of the pollutants subject to PSD review was the BACT limit proposed by the department. The emission rates used for each of the non-PSD pollutants addressed in this report were upper limits to estimated emissions of these pollutants as adjusted to reflect the control expected by the department. The emission rates for all pollutants addressed in this report are listed in Table I.

Table I

Lake County Waste-to-Energy Facility  
Air Pollutant Emissions Rates

Pollutant	Applicant Proposed Emission (lb/MBTU)	DER Proposed Emission (lb/MBTU)	DER Proposed Maximum Emission Rate (lb/hr)	DER Proposed Maximum Annual Emission Rate (Ton/Yr)
Sulfur Dioxide (SO <sub>2</sub> )	0.6	0.56	116.7	255
Nitrogen Oxides (NO <sub>x</sub> )	0.5	0.5	104.2	456
Particulate Matter (PM)	0.067	0.045	9.4	41
Carbon Monoxide (CO)	0.45	0.45	93.7	411
Lead (Pb)	0.0012	0.001	0.2	0.9
Volatile Organic Compounds (VOC)	0.04	0.04	8.3	36
Mercury (Hg)	0.0007	0.0007	0.146	0.6
Fluorides (F <sup>-</sup> )	0.006	0.006	1.25	5.5
Beryllium (Be)	1.0 x 10 <sup>-7</sup>	1.0 x 10 <sup>-7</sup>	2.08 x 10 <sup>-5</sup>	0.0001
Asbestos	negl.	negl.	-	-
Vinyl Chloride (CH <sub>2</sub> CH CR)	negl.	negl.	-	-
Sulfuric Acid Mist (H <sub>2</sub> SO <sub>4</sub> )	0.004	0.004	0.83	3.7
Hydrogen Sulfide (H <sub>2</sub> S)	negl.	negl.	-	-
Total Reduced Sulfur (TRS)	negl.	negl.	-	-
Reduced Sulfur Compounds (RSC)	negl.	negl.	-	-
Hydrogen Chloride (HCl)	0.9	0.9	187.5	821

(1) Maximum heat content of fuel is 5000 BTU/lb. At maximum throughput of 500 TPD of MSW the maximum heat input is 208.3 MBTU/hr, (million Btu/hr) or 10 MBTU/ton MSW.

The applicant has submitted dispersion modeling which: (1) quantifies the maximum ambient impacts due to the new facility alone; (2) determines the maximum distance from the facility to which a significant impact can occur; (3) quantifies the maximum impact near the proposed new facility from other facilities in the area; and (4) quantifies the maximum impact on the Chassahowitzka National Wilderness Class I area.

The stack and adjacent building dimensions and emission characteristics of the modeled sources are listed in Table II. The maximum concentrations predicted from the proposed facility were determined using a grid resolution of 0.1 km in range and 10 degrees in azimuth. Since the proposed stack height is less than the calculated GEP height, building wake downwash was included in the modeling. Also, the artificial persistence of wind direction due to the way calm winds are coded in the National Weather Service data set was filtered from the results.

The results of the modeling analysis are presented in the individual sections that follow. It should be noted that the results are based on the emission rates proposed by the department. These rates represent either the BACT emission limitations or the limitation which the department believes best estimates that particular pollutant, including control if applicable.

A more detailed description of the modeling analysis along with the model output is contained in the NRG application. The department has reviewed the applicants analysis and found that it conforms with the guidelines established by the EPA and followed by the department.

### III. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring may be required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA reference, or the equivalent monitor must be submitted. Sometimes less than one year of data, but not less than four months, may be accepted when department approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined through air quality modeling, is less than a pollutant-specific "de minimus" concentration. In addition, if current monitoring data already exist and these data are representative of the proposed source

Table II

Lake County Waste-to-Energy Facility  
Stack Parameters

Source	UIM E (km)	UIM N (km)	Stack Height (m)	Exit Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	Bldg. Height (m)	Bldg. Length (m)	Bldg. Width (m)
Unit 1	413.12	3179.26	38.1	450	20.0	1.83	22.0	38.1	19.8
Unit 2	413.12	3179.26	38.1	450	20.0	1.83	22.0	38.1	19.8
Asphalt Production Corporation	407.1	3180.9	7.6	347	4.6	2.28			

area, then at the discretion of the department these data may be used.

The predicted maximum air quality impacts of the proposed facility for those pollutants subject to PSD review are given in Table III. The monitoring "de minimus" level for each pollutant is also listed. All pollutants, except SO<sub>2</sub>, have maximum predicted impacts below their respective "de minimus" values. Therefore, specific preconstruction monitoring is not required for those pollutants. Modeling of existing sources shows ambient SO<sub>2</sub> levels are below the "de minimus" value. The department, therefore, did not require preconstruction monitoring for SO<sub>2</sub>. There is currently only one monitor (measuring PM) within 50 km of the proposed facility. This monitor is located in Zellwood, Florida, approximately 30 km away. Since sources of air pollution are few in this area, background concentrations are relatively low and have not been quantified.

#### IV. PSD Increment Analysis

The PSD increments represent the amount that new sources may increase the ambient ground-level concentrations of SO<sub>2</sub> and PM. The purpose of these increment limitations is to keep areas with currently good air quality remaining that way. At no time, however, can the increased emissions of these pollutants cause or contribute to a violation of the ambient air quality standards.

The proposed NRG facility is to be located in a Class II area and must meet the increments defined for this class. The facility will also be approximately 70 km from the Chassahowitzka National Wilderness Class I area. The applicant must also show that the PSD Class I increments are not exceeded in that area.

All SO<sub>2</sub> and PM emissions increases from sources constructed or modified after the baseline date (December 1977) will consume PSD increment. In addition, all SO<sub>2</sub> and PM emissions increases associated with construction or modification of major sources which occurred after January 6, 1975, will consume increment.

All of the emissions of SO<sub>2</sub> and PM at the proposed NRG facility will consume increment. Modeling of the proposed facility itself shows that there will be no significant ambient impact for PM. That is, the maximum ambient PM concentrations due to the proposed facility will be less than 1 ug/m<sup>3</sup>, annual average, and less than 5 ug/m<sup>3</sup>, 24-hour average. As such, no other increment consuming sources were evaluated. For SO<sub>2</sub>, modeling shows a significant impact extending out to eight kilometers from the center of the proposed site. No other sources of SO<sub>2</sub> which consume PSD increment have been identified in the vicinity of the proposed NRG facility. Thus, only the increment consumed by the NRG facility is compared to the

Table III

Lake County Waste-to-Energy Facility  
 Maximum Air Quality Impacts for  
 Comparison to "De Minimus" Ambient Levels

Pollutant and Averaging Time	Predicted Maximum Impact (ug/m <sup>3</sup> ) (1)	De Minimus Ambient Impact Level (ug/m <sup>3</sup> )
SO <sub>2</sub> (24-hour)	21.3	13
PM (24-hour)	1.7	10
NO <sub>2</sub> (annual)	0.8	14
CO (8-hour)	40.1 (2)	575
Pb (24-hour)	0.006	0.1
Hg (24-hour)	0.03	0.25
F- (24-hour)	0.20	0.25

(1) Predicted highest, second-high concentrations at DER proposed emission rates.

(2) 3-hour average concentration used as a conservative estimate of 8-hour average.

increment limitations. Table IV shows the results of the PSD increment analysis. The department has reasonable assurance that neither the PM or SO<sub>2</sub> PSD increments will be exceeded for either the Class I or Class II areas.

#### V. Ambient Air Quality Standards (AAQS) Analysis

Of the pollutants subject to review, only the criteria pollutants PM, SO<sub>2</sub>, CO, NO<sub>2</sub>, and Pb have an AAQS with which to compare. Dispersion modeling was performed by the applicant as described in the modeling methodology section. Predicted maximum ambient concentrations due to the NRG facility itself were less than defined significant impact levels for PM, CO, and NO<sub>2</sub>. Therefore, no further analysis was completed for these pollutants. The predicted maximum concentration for lead, although small, does not have a defined significant impact level to compare to. Only SO<sub>2</sub> emissions result in significant ambient impacts. Additional sources of SO<sub>2</sub> were evaluated along with the NRG facility for comparison to the AAQS.

The total ambient air quality impact of a pollutant is obtained by adding a "background" concentration to the maximum modeled concentrations. This "background" concentration takes into account all sources of this pollutant not explicitly modeled. Usually, an estimate of this value is obtained from local monitoring data. No monitoring data exists in the local area and monitoring was not required of the applicant. Since SO<sub>2</sub> is the only pollutant for which a background value is necessary and since all major SO<sub>2</sub> sources in the area were modeled, a background value of zero ug/m<sup>3</sup> is estimated.

Given existing air quality in the area of the proposed facility, emissions from this facility are not expected to cause or contribute to a violation of an AAQS. Table V shows the results of AAQS analysis.

#### IV. Additional Impacts Analysis

##### A. Impacts on Soils and Vegetation

The total ground-level concentrations of the criteria pollutants are predicted to be well below all applicable AAQS including the national secondary standards designed to protect public welfare-related values. As such, these pollutants are not expected to have a harmful impact on soils and vegetation.

Of the noncriteria pollutants addressed in this report, both Hg and F<sup>-</sup> are predicted to have maximum concentrations less than their respective "de minimus" concentration levels. At these small concentrations, the department expects no adverse impact on soils and vegetation.

Table IV

Lake County Waste-to-Energy Facility  
PSD Increment Analysis

Pollutant and Averaging Time	Maximum Predicted Increase (ug/m <sup>3</sup> )	Allowable Class II Increment (ug/m <sup>3</sup> )	Predicted Class I Area Impact (ug/m <sup>3</sup> )	Allowable Class I Increment (ug/m <sup>3</sup> )
SO <sub>2</sub>				
3-hour	50	512	4	25
24-hour	21	91	1	5
Annual	1	20	<<1	2
PM				
24-hour	2	37	<1	10
Annual	<1	19	<<1	5



Table V

Lake County Waste-to-Energy Facility  
Ambient Air Quality Standards Analysis

Pollutant and Averaging Time	Maximum Predicted Impact of Project (ug/m <sup>3</sup> )	Predicted Impact of Other Sources (ug/m <sup>3</sup> )	Total Impact (ug/m <sup>3</sup> )	Florida AAQS (ug/m <sup>3</sup> )
SO <sub>2</sub> (1)				
3-hour	50	19	69	1300
24-hour	21	6	27	260
Annual	1	<1	1	60
PM				
24-hour	2	-	-	150
Annual	<1	-	-	60
NO <sub>2</sub>				
Annual	3	-	-	100
CO				
8-hour	31(2)	-	-	10,000
24-hour	45(3)	-	-	40,000
Pb				
quarterly	<0.1	-	-	1.5

(1) Background concentration assumed 0 ug/m<sup>3</sup>.

(2) 8-hour value estimated as 7/9 of 3-hour value.

(3) 1-hour value estimated as 10/9 of 3-hour value.

## B. Impact on Visibility in the Class I Area

An EPA Level-1 visibility screening analysis was performed by the applicant for the Chassahowitzka National Wilderness Area. The results indicate no impact on visibility in this area is expected as a result of the proposed NRG facility.

## C. Growth-Related Air Quality Impacts

The proposed NRG facility is not expected to significantly change employment, population, housing, or commercial/industrial development in the area to the extent that a significant air quality impact will result.

## D. GEP Stack Height Determination

Good Engineering Practice (GEP) stack height is defined as the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or projected width, whichever is less. A single stack will be constructed servicing both incinerator/boiler units. The proposed stack height is 38.1 meters. The height of the adjacent building is 21.9 meters. The projected width of the building is 27.5 meters. Thus, the proposed stack will be shorter than the calculated GEP height. Building wake downwash effects were included in the modeling to account for potential enhanced ground-level concentrations.

## E. Noncriteria Pollutants

The applicant has addressed two noncriteria pollutants, Hg and F<sup>-</sup>, as being applicable to the PSD regulations. Noncriteria pollutants have no ambient air quality standards with which to compare predicted ambient air concentrations. These pollutants are regulated by the application of BACT. Hg is additionally subject to NESHAP standards.

## F. Non-PSD Pollutants

The department requested that the applicant address hydrogen chloride (HCl) in its PSD application. The department is concerned with the potentially high emissions of this pollutant and its highly corrosive characteristics. Although HCl is not specifically regulated through the PSD regulations, it is closely regulated for hazardous waste incinerators. Many other states directly regulate HCl and other acid gases through their PSD regulations. The department has initiated rulemaking for MSW plants, and this rule may require additional control for HCl.

The applicant has estimated emissions of HCl, uncontrolled, to be as high as 820 tons per year. At this emission rate, maximum hourly concentration levels would be approximately 100 ug/m<sup>3</sup>.

For comparison purposes, one percent of the OSHA threshold limit value (TLV) is often used as an upper limit of acceptable concentrations in the ambient air. This percentage reduction in the TLV takes into account that some numbers of the general public are expected to be more sensitive than persons in the workplace.

For HCl that level is 70 ug/m<sup>3</sup>. Thus, there appears to be some potential for human effects if HCl is uncontrolled. In addition, HCl is a highly corrosive acid which can affect the other components of the emission system.

Providing space for the future installation of equipment to control HCl and other acid gases is being required by the department for the NRG facility. This control, if required as a result of state rulemaking that is currently in progress, should reduce emissions of HCl by 90 percent. The ambient impacts at this reduced emission level would be below one percent of the OSHA TLV level. In addition, control of HCl would substantially decrease the amount of corrosion to the emission system.

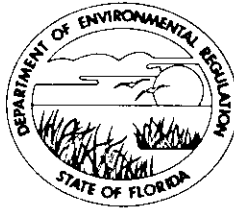
#### IV. Conclusion

The emission limits that will be imposed have been determined to be in compliance with all applicable requirements of FAC Rule 17-2. The permitted maximum allowable emission limits should not cause any violation of Florida's ambient air quality standards.

The General and Specific Conditions listed in the proposed construction permits (attached) will assure compliance with all applicable requirements of FAC Rule 17-2.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING  
2600 BLAIR STONE ROAD  
TALLAHASSEE, FLORIDA 32301-8241



BOB GRAHAM  
GOVERNOR  
VICTORIA J. TSCHINKEL  
SECRETARY

PERMITTEE:  
NRG/Recovery Group  
1616 Athens Street  
Lakeland, Florida 33803

Permit Number: AC 35-115379  
Expiration Date: May 31, 1988  
County: Lake  
Latitude/Longitude: 28° 44' 22"N/  
81° 53' 23"W  
Project: Lake County Waste to Energy  
Facility Units 1 and 2

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawings, plans, and other documents attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the construction of two (2) 250 ton per day incinerators which will be fueled by municipal solid waste and wood chips.

Construction shall be in accordance with the attached permit application and additional information except as otherwise noted in the Specific Conditions.

Attachments are as follows:

1. Application to Construct an Air Pollution Source, DER Form 17-1.202(1).
2. Mr. C. P. Nichol's letter dated June 26, 1986.

**PERMITTEE:**  
NRG/Recovery Group

**Permit Number:** AC 35-115379  
**Expiration Date:** May 31, 1988

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

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. Nor 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 does not constitute a waiver of 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 acknowledgement 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, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, 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.

PERMITTEE:  
NRG/Recovery Group

Permit Number: AC 35-115379  
Expiration Date: May 31, 1988

**GENERAL CONDITIONS:**

6. The permittee shall at all times 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, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

- a. Having access to and copying any records that must be kept under the conditions of the permit;
- b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and
- c. Sampling or monitoring 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 notify and provide the department with the following information:

- a. a description of and cause of non-compliance; and
- b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:  
NRG/Recovery Group

Permit Number: AC 35-115379  
Expiration Date: May 31, 1988

**GENERAL CONDITIONS:**

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 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 arising under the Florida Statutes or department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

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 17-4.12 and 17-30.30, 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 is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

- (x) Determination of Best Available Control Technology (BACT)
- (x) Determination of Prevention of Significant Deterioration (PSD)
- (x) Compliance with New Source Performance Standards.

14. The permittee shall comply with the following monitoring and record keeping requirements:

- a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

**PERMITTEE:**  
NRG/Recovery Group

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Expiration Date: May 31, 1988

**GENERAL CONDITIONS:**

- b. The permittee shall retain 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), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be 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:
- the date, exact place, and time of sampling or measurements;
  - the person responsible for performing the sampling or measurements;
  - the date(s) analyses were performed;
  - the person responsible for performing the analyses;
  - the analytical techniques or methods used; and
  - 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 submitted or corrected promptly.

**SPECIFIC CONDITIONS:**

1. The sources are permitted for continuous operation (8,760 hours per year).
2. The units shall be fueled only with municipal solid waste, or a combination of municipal solid waste and wood chips.
3. Each incinerator boiler shall not be loaded in excess of 20,833 pounds per hour (250 tons per day) of municipal solid waste.



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NRG/Recovery Group

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Expiration Date: May 31, 1988

**SPECIFIC CONDITIONS:**

4. Stack emissions from each unit shall not exceed the following:
  - a. Particulate Matter: 0.020 grains per dry standard cubic foot dry gas corrected to 12% CO<sub>2</sub> (0.45 lb/ton, 4.7 lb/hr or 20.6 tons/yr).
  - b. Sulfur Dioxide: 2.8 lb/ton or 29.2 lb/hr 30 day rolling average not to exceed 5.6 lb/ton or 58.4 lb/hr or 127.9 tons/yr.
  - c. Nitrogen Oxides: 5.0 lb/ton, 52.1 lb/hr or 228.2 tons/yr.
  - d. Carbon Monoxide: 400 ppm<sub>dv</sub> corrected to 12% CO<sub>2</sub> 8 hour average and 100 ppm<sub>dv</sub> corrected to 12% CO<sub>2</sub> 4 day average or 4.5 lb/ton or 46.9 lb/hr or 205.4 tons/yr.
  - e. Volatile Organic Compounds: 0.40 lb/ton or 4.2 lb/hr or 18.4 tons/yr.
  - f. Lead: 0.010 lb/ton, 0.1 lb/hr or 0.5 ton/yr.
  - g. Beryllium: 1 x E-6 lb/ton, 10.4 x E-6 lb/hr or 4.6 x E-5 ton/yr.
  - h. Fluoride: 0.060 lb/ton, 0.63 lb/hr or 2.8 ton/yr.
  - i. Sulfuric Acid Mist: 0.040 lb/ton, 0.42 lb/hr or 1.8 ton/yr.
  - j. Mercury: 3200 grams per day for the entire facility.
  - k. Visible Emissions: Opacity shall be no greater than 15% maximum six minute average except that visible emissions with no more than 20% opacity may be allowed for up to three consecutive minutes in any one hour except during startup or malfunctions when the provisions of 17-2.250, FAC, shall apply.
  - l. Odor: There shall be no objectionable odor at the site boundary.

PERMITTEE:  
NRG/Recovery Group

Permit Number: AC 35-115379  
Expiration Date: May 31, 1988

**SPECIFIC CONDITIONS:**

5. Compliance tests shall be run at full design capacity.
6. Compliance will be demonstrated by the maximum firing of each permitted fuel.
7. Compliance with the permitted allowable limitations shall be demonstrated in accordance with DER Methods 1, 2, 3, and 9; 40 CFR 60, Appendix A, Methods 5, 7, 8, 10, 13A or 13B and 18; 40 CFR 61, Method 10 and Method 103 or 104. Particulate testing shall include one run during representative soot blowing which shall be averaged proportionally to normal daily operations. Visible emission testing shall be conducted simultaneously with soot blowing and non-soot blowing runs.
8. Fifteen (15) days prior notification of the compliance tests shall be given to St. Johns River District office.
9. Compliance tests shall be submitted to DER's St Johns River District office within 45 days after completion of the tests.
10. The construction shall reasonably conform to the plans and schedule submitted in the application. If the permittee is unable to complete construction on schedule, he must notify the department in writing 60 days prior to the expiration of the construction permit and submit a new schedule and request for an extension of the construction permit, FAC Rule 17-4.09.
11. Continuous emission monitors for opacity, oxygen and carbon dioxide shall be installed, operated and certified in accordance with 40 CFR 60, Appendix B. Continuous monitors for carbon monoxide and combustion temperature shall be installed and operated. The monitors shall be capable of providing adequate data for the calculation of continuous combustion efficiency of not less than 99.50% given by the formula:

$$\%CE = \left[ \frac{1}{1 + \left( \frac{CO}{CO_2} \right)} \right] \times 100$$

where: %CE is the percent combustion efficiency  
CO is the carbon monoxide concentration in ppm  
CO<sub>2</sub> is the carbon dioxide concentration in ppm

PERMITTEE:  
NRG/Recovery Group

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Expiration Date: May 31, 1988

**SPECIFIC CONDITIONS:**

12. To obtain a permit to operate, the permittee must demonstrate compliance with the conditions of this construction permit and submit a complete application for an operating permit, including the application fee, along with the compliance test results and Certificate of Completion, to the department's St. Johns River District office 90 days prior to the expiration date of this construction permit. The permittee may continue to operate in compliance with all terms of the construction permit until its expiration date. Operation beyond the construction permit expiration date require a valid permit to operate, FAC Rule 17-4.22.

13. If the construction permit expires prior to the permittee requesting an extension or obtaining a permit to operate, then all activities at the project must cease and the permittee must apply for a new permit to construct which can take up to 90 days to process a complete application, FAC, Rule 17-4.10.

14. Space will be provided to allow for the retrofit of additional air pollution control equipment, as may be required by subsequent rule.

Issued this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_

STATE OF FLORIDA DEPARTMENT OF  
ENVIRONMENTAL REGULATION

\_\_\_\_\_  
VICTORIA J. TSCHINKEL, Secretary

\_\_\_\_\_ pages attached.

Best Available Control Technology (BACT) Determination  
 Lake County Waste to Energy Facility  
 Lake County

The applicant plans to construct a 500 ton per day (TPD) waste-to-energy resource recovery facility to be located near Leesburg, Florida in Lake County. The thermal energy from combustion of the solid waste will be used to produce steam for electric power generation.

The present plans are to install two 250 TPD mass burn incinerators which will be fueled with a combination of municipal solid waste (MSW) and wood chips. The total daily input of combined fuels per unit shall not exceed the total heat input from 250 TPD of 5,000 Btu per pound MSW only. The wood chips heat input will not exceed twenty-five percent of total input assuming the wood chips have a heating value of 4,500 Btu per pound at fifty percent moisture content. The intent is to utilize wood only at times when there is a deficiency of MSW.

Each incinerator is scheduled to operate 24 hours per day, 7 days per week, although the capacity factor is projected to be closer to 85 percent. The emission rates of the various pollutants emitted from the facility are calculated in tons per year based on 100 percent capacity. The applicant has projected the total maximum annual tonnage of regulated air pollutants emitted from the two units to be as follows:

Pollutant	Maximum Annual Emissions (Tons/Year)	PSD Significant Emission Rate (Tons/Year)
Particulate (PM)	60	25
Sulfur Dioxide (SO <sub>2</sub> )	547	40
Nitrogen Oxides (NO <sub>x</sub> )	455	40
Carbon Monoxide (CO)	101	100
Vol. Org. Cmpds (VOC)	36	40
Lead (Pb)	1.1	0.6
Mercury (Hg)	0.6	0.1
Beryllium (Be)	0.0001	0.0004
Fluorides (F)	5.5	3
Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )	4	7

The Lake County solid waste energy recovery facility was reviewed according to Florida Administrative Code Chapter 17-2 and Rule 17-2.500: Prevention of Significant Deterioration (PSD). The

Bureau of Air Quality Management (BAQM) performed the air quality review, which includes this BACT determination. Rule 17-2.500(2)(f)3 requires a BACT review for all regulated pollutants emitted from a major facility in an amount equal to or greater than the significant emission rates listed in Table 500-2, Regulated Air Pollutants. The facility is located in an area classified as attainment for all criteria air pollutants.

BACT Determination Requested by the Applicant:

The following emission limits are based upon a ton of refuse basis.

PM - 0.67 lbs	CO - 4.5 lbs	Hg - 0.007 lbs
SO <sub>2</sub> - 6.0 lbs	Pb - 0.012 lbs	F - 0.06 lbs
NOx - 5.0 lbs	Be - 1.0 x E-6 lbs	VOC - 0.40 lbs
H <sub>2</sub> SO <sub>4</sub> - 0.04 lbs	HCl - 9.0 lbs	

Date of receipt of a BACT application:

March 18, 1986

Date of publication with Florida Administrative Weekly:

May 23, 1986

BACT Determination by DER:

Pollutant	Emission Limit Per Unit
Particulate Matter	0.020 grains/dscf, corrected to 12% CO <sub>2</sub>
Sulfur Dioxide	*2.8 lb/ton refuse charged, 30 day average, not to exceed 5.6 lb/ton
Nitrogen Oxides	5.0 lb/ton refuse charged
Carbon Monoxide	100 ppm <sub>dv</sub> corrected to 12% CO <sub>2</sub> , 4 day average 400 ppm <sub>dv</sub> , corrected to 12% CO <sub>2</sub> , 8 hour average
Fluorides	*0.06 lb/ton
Lead	0.010 lb/ton
Mercury	3200 grams/day (1)
Beryllium	1.0 x E-6 lb/ton refuse charged

VOC 0.40 lb/ton refuse charged,  
Visible Emission 15% opacity, six minute  
average

\*Subject to change in accordance with rulemaking for resource recovery facilities.

(1) Total emissions from the facility shall not exceed this value. Compliance with the mercury emissions limit shall be demonstrated in accordance with 40 CFR 61, Method 101 Appendix B.

Compliance with limitations for sulfur oxides, particulate matter, and nitrogen oxides will be demonstrated in accordance with Florida Administrative Code Rule 17-2.700, DER Methods 1, 2, 3, 4, and 6, and 40 CFR 60 Appendix A; Method 5, 7, 10, 12, 13A or 13B. Compliance with the opacity limit shall be demonstrated in accordance with Florida Administrative Code Rule 17-2.700(6)(a)9., DER Method 9.

A continuous monitoring system to measure combustion temperature plus CO, O<sub>2</sub>, CO<sub>2</sub> levels and opacity of the stack's emissions shall be installed, calibrated, and maintained in accordance with the provisions of Rule 17-2.710, Continuous Emission Monitoring Requirements. The CEM's must be installed and operational prior to compliance testing. In addition, the combustion efficiency calculated by:  $\% CE = (1/(1 + (CO/CO_2))) \times 100$  shall be at least 99.5%.

#### BACT Determination Rationale:

Each incinerator will have a charging rate more than 50 tons per day, and therefore, is subject to the provisions of 40 CFR 60.50, Subpart E, New Source Performance Standards (NSPS). The NSPS standard regulates only particulate matter. The particulate matter standard is 0.08 grains/dscf, corrected to 12% CO<sub>2</sub>. This NSPS was promulgated in 1971 and no longer reflects state-of-the-art for control of particulate emissions. Recent stack testing data for MSW incinerators indicates that both electrostatic precipitator and fabric filter control technology are capable of controlling particulate emissions well below the applicant's proposal of 0.03 grains/dscf. Based on the control technology available, a particulate matter emissions limit of 0.020 grains/dscf corrected to 12% CO<sub>2</sub> is judged to represent BACT for an installation of this size, and location. All the other requirements as set forth in the NSPS, Subpart E, will apply.

The Department has determined the emission limit for SO<sub>2</sub> to be 2.8 pounds per ton of refuse charged into the incinerator based on a 30 day average. MSW components that appear to be major

contributors of sulfur include rubber, plastics, food wastes, yard wastes, and paper.

The SO<sub>2</sub> emission limit was determined to be BACT by evaluating studies of emissions test data for similar MSW incinerators. Various studies have indicated average emission levels of 2.0 to 2.8 lb SO<sub>2</sub>/ton MSW charged with deviations of  $\pm$  1.3 to 1.6 lb/ton. The amount of SO<sub>2</sub> emitted would be comparable to the burning of distillate oil having less than a 0.5% sulfur content. Burning low sulfur fuel is one acceptable method of controlling SO<sub>2</sub> emissions in industrial boilers. The installation of a flue gas desulfurization system to control SO<sub>2</sub> emissions alone is not warranted when burning MSW.

The mercury emission limit determined as BACT is equal to the National Emission Standard to Hazardous Air Pollutants (NESHAPs), 40 CFR 61.50, Subpart E, for municipal wastewater sludge incineration plants. The BACT is determined to be 3200 grams per day for the entire facility. This level of mercury emissions is not considered to have a major impact on the environment.

The uncontrolled emission of beryllium, according to the <sup>1</sup>California report on emissions from resource recovery facilities, when firing MSW is estimated to be  $6.2 \times 10^{-6}$  pounds per million Btu. Uncontrolled beryllium emissions would be approximately 11 grams per 24 hours or 0.01 TPY. The operating temperature of the particulate matter emission control device will be below 500°F. Operation below this temperature is necessary to force adsorption/condensation of beryllium oxides, present in the flue gas stream onto available fly ash particles for subsequent removal by the particulate control device. The annual beryllium emissions are estimated at 0.0001 tons per year. This amount of beryllium emitted is considered to have a negligible impact on the environment. The emission factor of  $1.0 \times 10^{-6}$  lb/ton MSW proposed by the applicant is judged to be BACT. If, however, beryllium containing waste as defined in the National Emission Standards for Hazardous Air Pollutants (NESHAPs), Subpart C, Subsection 61.31(g), is charged into the incinerator, emissions of beryllium to the atmosphere shall not exceed 10 grams per 24 hours or an ambient concentration of 0.01 ug/m<sup>3</sup>, 30 day average. Compliance with this beryllium emission limit will be in accordance with the NESHAPs, Subpart C.

The applicant has projected abated lead and fluoride(s) emissions to be 1.1 and 5.5 tons per year respectively. These amounts are in excess of the significant emission rates given in Florida Administrative Code Rule 17-2.500, Table 500-2.

With respect to lead emissions, two conditions are needed to achieve high removal efficiencies of metallic compounds emitted at refuse burning facilities: (1) operation of particulate matter control equipment at temperatures below 260°C (500°F), and

<sup>1</sup> Air Pollution Control At Resource Recovery Facilities, California Air Resource Board, May 24, 1984.

(2) consistently efficient removal of submicron fly ash particles. The maximum temperature of the incinerator combustion gases at the inlet to the particulate control device is estimated to be 375°F. At this temperature the particulate control equipment would be capable of removing the lead emissions from the flue gas stream.

When flue gas temperatures are lowered below 260°C (500°F), metallic compounds are removed from the vapor phase by adsorption and condensation preferentially on fine particles with submicron particles receiving the highest concentrations of metals. Properly designed and operational fabric filter systems appear at this time to offer the best method for consistent and efficient removal of fine (and in particular submicron) fly ash. Removal efficiencies of fine fly ash using these systems can be in excess of 99% with respect to MSW incinerators. Studies have indicated the weight percent of submicron particles emitted from combustion is on the order of 45% which clearly indicates the need for efficient control of particles in this range.

The <sup>1</sup>California Air Resources Board (CARB) report on resource recovery facilities indicates that the highest uncontrolled lead emission rate from refuse-fired incinerators tested is 16,000 ug/MJ. Based on a heating value of 5,000 Btu per pound of refuse, this equates to an emission rate of 0.37 lbs per ton refuse charged. Recent testing of baghouses and high efficiency four field electrostatic precipitators indicates that lead removal efficiencies greater than 99% are being achieved with both types of control devices. Taking into consideration this maximum emission rate and the required particulate control level for this facility (0.020 grains/dscf, corrected to 12% CO<sub>2</sub>,) 0.010 lbs per ton of refuse charged is judged to be reasonable as BACT for lead emissions.

Emissions of fluoride originate from a number of sources in the refuse. The mechanisms of governing fluoride release and formation of hydrogen fluoride at refuse-burning facilities are probably similar to those for hydrogen chloride. The control of fluorides can be reduced at refuse-burning plants by removal of selected refuse components with high fluoride contents, or the use of flue gas control equipment. In view of the fact that it is proposed to incinerate materials that contain fluoride, BACT for the control of fluorides is leaving space for the installation of a wet or dry flue gas scrubber system. The addition of a scrubber system would also provide control for SO<sub>2</sub> emissions addressed earlier in this analysis as well as other acid gases which will be addressed in other sections of the analysis.

During combustion of municipal solid waste, NO<sub>x</sub> is formed in high temperature zones in and around the furnace flame by the oxidation of atmospheric nitrogen and nitrogen in the waste. The



two primary variables that affect the formation of NO<sub>x</sub> are the temperature and the concentration of oxygen. Techniques such as the method of fuel firing to provide correct distribution of combustion air between overfire and underfire air, exhaust gas recirculation, and decreased heat release rates have been used to reduce NO<sub>x</sub> emission. A few add-on control techniques such as catalytic reduction with ammonia and thermal de-NO<sub>x</sub> are still experimental and are not considered to be demonstrated technology for the proposed project. State-of-the-art control of the combustion variables will be used to limit NO<sub>x</sub> emissions at 5.0 pounds per ton of MSW charged. This level of control is judged to represent BACT.

Carbon Monoxide is a product of incomplete combustion where there is insufficient air. Incomplete combustion will also result in the emissions of solid carbon particulates in the form of smoke or soot and unburned and/or partially oxidized hydrocarbons. Incomplete combustion results in the loss of heat energy to the boiler. The applicant proposes that good equipment design and practice plus continuous CO monitors are BACT for carbon monoxide. The department has determined that an emission limit for carbon monoxide which would correspond to optimum combustion is needed. Based on technical information relating good combustion practices to the control of dioxin emissions and BACT determinations from other states, a limit of 400 ppm<sub>dv</sub> corrected to 12% CO<sub>2</sub> for an 8 hour average and 100 ppm<sub>dv</sub> corrected to 12% CO<sub>2</sub> for a 4 day average in combination with a combustion efficiency of at least 99.5% is judged to represent BACT for carbon monoxide emissions.

Furthermore, CO has a calorific value of 4347 Btu/lb and when discharged to the atmosphere represents lost heat energy. Since heat energy is used to produce the steam which drives the generator to produce electric power, there is an economic incentive to minimize CO emissions.

Hydrocarbon emissions, like carbon monoxide emissions, result from incomplete oxidation of carbon compounds. Control of CO and HC emissions can be mutually supportive events. BACT for hydrocarbons is good combustion practices which correspond to the carbon monoxide limitation above.

Sulfur dioxide produced by combustion of sulfur containing materials can be oxidized to SO<sub>3</sub> which can then combine with water vapor to produce sulfuric acid mist. The applicant has stated that maximum sulfuric acid mist emissions would be 4.0 tons per year for the resource recovery facility. The installation of an acid gas control system would minimize sulfuric acid mist emissions.

The type of air pollutants emitted when incinerating plastics depends on the atomic composition of the polymer. Plastics

composed of only carbon and hydrogen or carbon, hydrogen and oxygen form carbon dioxide and water when completely combusted. Incomplete combustion yields carbon monoxide as the major pollutant.

Plastics containing nitrogen as a heteroatom yield molecular nitrogen, some  $\text{NO}_x$ , carbon dioxide, and water when completely combusted. Incomplete combustion may yield hydrogen cyanide, cyanogen, nitrites, ammonia and hydrocarbon gases. Complete combustion of plastics containing halogen or sulfur heteroatoms form acid gases such as hydrogen chloride, hydrogen fluoride, sulfur dioxide, carbon dioxide, and water. Halogen or sulfur compounds can form from incomplete combustion of plastic. Polyvinyl chloride (PVC), one of the many polymers, has been implicated as causing the most serious disposal problem due to the release of hydrogen chloride (HCl) gas when incinerated. This problem has long been realized resulting in other polymers being used in packaging. For example, the weight percent of chlorine in polyurethane is 2.4, with only trace amounts in polyethylene and polystyrene, as compare to the weight percent of 45.3 in PVC.

A recent study of MSW incineration performed for the USEPA has indicated that the plastics content of refuse is expected to grow by 300-400% from the year 1968 to 2000. This increase can be expected to increase uncontrolled HCl emissions from municipal waste incineration by roughly 400% from 1970 to the year 2000.

The applicant has stated that maximum HCl emissions from the incinerator are estimated to be 820 tons per year based on an emission factor of 9.0 lbs per ton of MSW incinerated. This emission factor appears to be consistent with the expected HCl emission rate when the MSW chlorine content and conversion rate are taken into account.

Data contained in the California Air Resources Board report on resource recovery facilities states that approximately 60 to 65 percent of refuse chlorine is converted to HCl at mass burn facilities. Based on using the MSW chlorine composition of 0.55 percent recently submitted in the Palm Beach County Resource Recovery Facility application, the resulting HCl emission would be 6.6 to 7.2 pounds per MSW charged. This value is slightly lower than the applicant's maximum estimate but the trend for the refuse chlorine content to increase will likely cause the applicant's factor to be surpassed. For example, the HCl emission factors for mass burn resource recovery facilities which are to be constructed in Bristol Connecticut, Bridgeport Connecticut, and Warren County New Jersey are expected to be 10.0, 11.4, and 11.6 pounds per ton of MSW charged respectively. Emissions of HCl at refuse incineration facilities can be reduced by removal of selected refuse components with high chlorine contents (source separation), combustion modification, and the

use of flue gas control equipment. Although the combustor configuration may influence the amount of chlorine conversion, combustion modification is not a viable means of controlling HCl emissions.

Potential emissions of HCl can be reduced significantly by removing plastic items from the waste stream. This is particularly true when the plastics are the PVC type explained earlier. With the exception of limited recycling efforts, source separation of plastics has not been demonstrated and costs are uncertain at this time. In addition to this, the combustion of plastics may be favorable from an energy point of view due to their relatively high heat of combustion.

All plastic materials have a high heat of combustion, for example, coated milk cartons - 11,300 Btu/lb, latex - 10,000 Btu/lb and polyethylene 20,000 Btu/lb. For comparison, newspaper and wood have a heat content of 8,000 Btu/lb, and kerosene 18,900 Btu/lb. Here again there is economic incentive to obtain as complete combustion as possible.

At this time flue gas controls are the most conventional means of reducing HCl emissions at refuse burning facilities. Based on the estimates of HCl emissions and the trend for increases due to higher percentages of plastics in future waste streams, the installation of a wet or dry scrubber would provide an added benefit of controlling HCl emissions.

An analysis of a proposal to construct a MSW incinerator in 1986 would not be complete unless the subject of dioxins was addressed.

Dioxin is a hazardous material that has generated widespread public concern. It is found in trace amounts whenever substances containing chlorine (for example, plant and animal tissues and plastics) are burned. It is also an impurity that can be found in some herbicides, such as "2,4,5-T".

The applicant has stated that the incinerator will be designed to operate at high temperature and provide necessary residence time to allow for more complete burnout of organic particles. At design capacity the incinerator will operate at 1800°F with a residence time of at least one second. The department believes that optimum combustion is essential to control the emissions of dioxins. Optimum combustion pertaining to the destruction of dioxins needs to be continually demonstrated by monitoring combustion temperature plus CO, O<sub>2</sub>, CO<sub>2</sub> levels as indications of combustion efficiency. In addition, scientists concerned with the destruction of dioxins in resource recovery facilities generally agree that a CO concentration limit of 400 ppm<sub>dv</sub>, corrected to 12% CO<sub>2</sub> for an 8 hour average and 100 ppm<sub>dv</sub>, corrected to 12% CO<sub>2</sub> for a 4 day average in combination with a

combustion efficiency of at least 99.5% is a good indicator that optimum combustion is occurring. This CO limit is judged to represent BACT for carbon monoxide also. Combustion temperatures must be maintained at least at 1800°F with residence times being at least 1 second.

Although the subject of dioxin is new, and relatively little is known, two important things stand out: 1) Dioxin is readily minimized in properly designed and operated BACT-equipped facilities, and 2) very small amounts cause demonstrable health effects. Although most of the reduction in dioxin emissions is believed to take place in the combustion chamber, the installation of acid gas control and a high efficiency particulate control device (grain loading not to exceed 0.02 gr/dscf) would provide an additional control strategy to remove dioxins from the flue gases based on the assumption which is thought by many that dioxins can be adsorbed on the surface of particulate matter. Thus, the greater the TSP collection, especially submicron particles, the better the dioxin control.

Throughout this BACT determination much emphasis has been placed on the controls that are needed to satisfy the BACT requirements. A dry scrubber used in conjunction with a baghouse appears to be the best method for controlling emissions from this type of facility.

Electrostatic precipitators (ESP's) without acid gas control remove Total Suspended Particulates (TSP) only, collecting submicron particles with difficulty. Submicron particle collection can be done, but as with any control, effectiveness and reliability are questionable in this area. The need for acid gas controls is clearly defined in this analysis and test data show fabric filters to be less sensitive to changes in flue gas volumes, inlet concentrations, and small excursions in temperature than ESP's usually employed at refuse burning facilities.

The recommendation that a dry scrubber baghouse combination should be used as the control strategy for the resource recovery facility and requirement that the applicant has to leave space for a flue gas scrubber system would not be warranted if the economic costs of installing and operating the recommended control technology outweigh the benefits of controlling the pollutants that would be controlled by the equipment.

The applicant has indicated that a dry scrubber system for the 500 TPD facility would cost 639,000 dollars per year. Assuming that the dry scrubber controls 70% SO<sub>2</sub> and 90% of the acid gases, an analysis of the cost required to control tonnage of pollutants removed is required.

Based on the cost of controlling the emissions of SO<sub>2</sub> alone, assuming an 85 percent annual capacity factor and the applicants proposed BACT emission limitation of 0.6 lb/million Btu, the installation and operation of a scrubber unit would remove 326 tons per year of SO<sub>2</sub> at a cost of \$1,960 per ton. This is not excessive compared to costs of up to \$2,000 per ton which are considered reasonable in developing EPA New Source Performance Standards. It should be noted that the limitation of 0.6 lb/million Btu is the maximum expected limit. The applicant believes that the expected initial average emission is approximately 0.3 lb/million Btu which would double the cost of SO<sub>2</sub> control on a per ton basis and not justify requiring scrubbing for SO<sub>2</sub> alone. However, since the resource recovery facility will emit other acid gases, the benefit obtained by acid gas scrubbing should be further addressed.

The applicant has stated that initial emission rates of HCL\* should not exceed 6 lb/ton. A dry scrubber would be capable of removing 90 percent of the HCL emissions (410 tons per year based on 6 lb/ton and 85 percent capacity factor). This removal would result in a cost of \$1,525 per ton which again is not excessive if the figure of \$2,000 per ton for SO<sub>2</sub> removal is used as a general guideline for all acid gas control using the applicants proposed initial emission rates. The combined SO<sub>2</sub> and HCL control decreases the cost of control to \$1,098 per ton which is indeed reasonable.

Using this type of analysis, the cost of controlling pollutants on a per ton basis is warranted. The cost of control using a dry scrubber becomes even more attractive since the scrubber is capable of removing 90% of fluoride and sulfuric acid mist emissions as well. In addition, it is expected that the trend is for SO<sub>2</sub> and HCL emissions to increase in the future as explained in previous sections of this analysis. When all these factors are taken into consideration, the expense of adding and operating a dry scrubber to this facility is not unreasonable.

The applicant has estimated the cost of adding a dry scrubber to the facility would result in an additional \$5.11 per ton of refuse incinerated, based on an 85 percent capacity factor. A review of economic analyses performed for proposed resource recovery facilities of similar size indicates that previous estimates for acid gas control were less than that proposed by the applicant. In the summary of the engineering evaluation (October 15, 1984) prepared for the Mid-Connecticut facility in Hartford Connecticut, the average bids for equipping resource recovery facilities with acid gas controls ranged from \$2.60 to \$3.36 per ton of refuse incinerated with the higher costs being associated with smaller units. It should be noted that an accurate comparison of projected costs can only be determined by equating the amortization periods, interest rates, and site specific costs. The Lake County proposal estimated the cost of

adding acid gas control using capacity factor of 85% which could be different from the other facilities and is likely one of the discrepancies that account for the difference in the proposed cost.

Previous analyses completed for larger facilities have indicated that the cost of using the scrubber-baghouse combination was not unreasonable compared to using an electrostatic precipitator alone. At rated capacity, a unit proposed for installation in the state of Connecticut showed that the cost of using the scrubber-baghouse combination and the precipitator alone were \$3.36 and \$1.83 respectively per ton of refuse charged. This comparison indicates the cost of using the scrubber-baghouse combination are less than would be expected when compared to the cost of using an electrostatic precipitator alone. The reasonableness of the scrubber-baghouse combination can be attributed to the following:

1) a scrubber cools the gases and reduces their volume which reduces the size requirement (cost) of the particulate control device, and 2) a dry scrubber is mechanically a simple device and capable of off-site fabrication.

At a recent conference held in Washington D. C. (November 1985), entitled "Acid Gas and Dioxin Control For Waste-to-Energy Facilities", a topic of great concern was the methods in which emissions from resource recovery facilities should be controlled. The general consensus of the conference speakers (including EPA) is that resource recovery facilities are best controlled with a dry scrubber-baghouse combination. More recently, the May 1986 "Resource Recovery Report" published additional findings which point to acid gas control and more importantly the dry scrubber-baghouse combination as being beneficial for resource recovery facilities. The World Health Organization (WHO) Working Group on Risks to Health of Dioxins from Incineration, Sewage, Sludge, and Municipal Waste is quoted by Carolyn Konheim, president of Konheim & Ketchum, Inc., an environmental consulting firm in New York City, as follows:

"The WHO Working Group's expectation that best case emission of dioxin, those resulting from good combustion, can be even further improved seems to be supported by recent test data from facilities in Quebec, Canada; Avesta, Sweden; and Nyberg, Denmark. Ms. Konheim said the addition of a dry scrubber to the flue gas control system, operating at 50 to 200 degrees Celsius, appears to achieve 80 to 99% removal of PCDDs. The best performance appears to be a scrubber/baghouse system operating at about 125 degrees Celsius. Removal is probably due to the condensation of dioxins which may have been formed in cold spots of the furnance onto particles in the scrubber."

Based on the scrubber's ability to control SO<sub>2</sub>, HCl\*, and other acid gas emissions, and recently documented dioxin control the department feels that the cost of adding acid gas control technology to the precipitator or using the dry scrubber-baghouse combination is not unreasonable for this facility. Assuming a realistic figure of 55,000 households being served by the facility when operation begins and the applicants cost estimate, the additional cost of providing dry scrubbing acid gas control to the proposed ESP would amount to less than \$1.00 per month per household. In addition, according to the bureau's analysis the incremental cost of using the dry scrubber-baghouse combination instead of the ESP only would amount to approximately \$1.16 per month per household. In view that businesses and industry will also generate refuse and share the cost, the actual cost per household for the alternative control measures is expected to be even less than the projections above. The added cost of using these alternative controls instead of an ESP alone, according to general equipment vendors, designers and contractors, is typically in the range of 2 to 5 percent of the total cost of the project and would be offset by the immediate economic and environmental benefits realized by the installation.

(\*Hydrochloric acid (HCl), though not listed as a pollutant regulated by the PSD rule for MSW incinerators, is intensely corrosive and should be included in the economic analysis when justifying the addition of flue gas scrubbing equipment. It is EPA policy that the control of nonregulated air pollutants may be considered in imposing a more stringent BACT limit on regulated pollutants (i.e, sulfur dioxide, fluorides), if there is a reduction in the nonregulated air pollutants which can be directly attributed to the control device selected for the abatement of the regulated pollutants. This policy was recently reaffirmed by the Administrator in a remand of a PSD permit for the North County Resource Recovery Facility in San Marcos, California. In addition, the EPA is currently requiring hazardous waste incinerators emitting more than four (4) pounds of HCl per hour to achieve a removal efficiency of 99%).

Although the bureau feels that the added cost per household of having acid gas controls on this facility is not unreasonable, the applicant does not agree. The applicant has stated that for the system as proposed, the reported cost to the county is approximately \$9.50/ton MSW incinerated, and an increase of \$5.00 to \$6.00/ton MSW to provide additional control of pollutants is not justified. The bureau and the applicant have studied the possibility of using other types of control which would provide less acid gas control but would result in costs at a fraction of that for a dry scrubbing system. One such technology is a dry injection system which is now being incorporated into a resource recovery facility of similar size in the state of Utah. The dry injection system is reported to provide 50 percent removal of acid gases at a cost of approximately \$1.50 per ton of MSW

incinerated. It should be noted that this particular technology has only been used at a test facility in Europe for MSW incineration and the Utah facility will be the first application of this technology on a full scale sized unit in the United States.

In view of the potentially sensitive concerns that have been identified with the Lake County facility, the bureau feels that BACT includes leaving space at the facility for installing acid gas control technology. In accordance with the content of this BACT determination, the bureau feels that the facility should be equipped with some degree of acid gas control and preferably the dry scrubber-baghouse combination. However, due to the specific economic concerns raised by the applicant and the uncertainty associated with acid gas control technologies, the bureau feels that more information is needed that would justify requiring this type of control at this time. In view of these concerns the bureau has determined that the level and type of acid gas controls used on this facility should be addressed and established through the process of state rulemaking which is now in progress for MSW incineration facilities located in Florida.

In summary, in addition to the emission limitations and other requirements specified in this determination, the applicant is required to leave space for acid gas control equipment at this facility and is subject to subsequent rule making which may require that acid gas control and other control measures be added to the facility.

The air quality impact of the proposed allowable emissions has been analyzed. Atmospheric dispersion modeling has been completed and used in conjunction with an analysis of existing air quality data to determine maximum ground-level ambient concentrations. Based on these analyses, the department has reasonable assurance that the proposed solid waste resource recovery facility in Lake County, subject to these BACT emission limitations and pending policies, will not cause or contribute to a violation of any PSD increment or ambient air quality standard.

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator  
Department of Environmental Regulation  
Bureau of Air Quality Management  
2600 Blair Stone Road  
Tallahassee, Florida 32301

Recommended by:

\_\_\_\_\_  
C. H. Fancy, P.E., Deputy Bureau Chief

Date: \_\_\_\_\_

Approved:

\_\_\_\_\_  
Victoria J. Tschinkel, Secretary

Date: \_\_\_\_\_