October 21, 1987
~~September 30, 1987~~

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LGM ENGINEERS
CONSTRUCTORS

Mr. Steve Smallwood
Chief
Bureau of Air Quality Management
State of Florida Department of Environmental Regulation
Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32301

RE: Lake County Waste-to-Energy Facility
Modification of Permit Conditions
Permit Numbers: AC35-115379 and PSD-FL-113

Dear Steve

I would like to thank you and your staff for the assistance provided regarding the Lake County Waste-to-Energy Facility.

As you are aware, beginning of construction for this project has been delayed pending resolution of U.S. EPA Region IV concerns regarding the level of emission control. As a result of the EPA action and the probable development of additional emission standards for existing facilities under Section III(d) of the Clean Air Act, it has been determined that the project would be best served by upgrading the level of emission control to state-of-the-art controls in accordance with the latest EPA guidance.

We propose to incorporate more stringent acid gas control than that required by the present permit. The revised emission controls will meet those emission limits that EPA now determines to be BACT.

Based on data that has become available since the permit was issued, it has been determined that contemporary municipal waste combustors may discharge higher nitrogen oxides emissions than allowed under the present permit. These higher nitrogen oxides emissions appear to be the result of design features which allow the unit to operate at higher temperature and combustion efficiency and to provide benefits of reduced carbon monoxide emissions and reduced organic products of incomplete combustion.

The attached report and revision of application date submitted earlier more fully describe the proposed facility changes. We request that you modify the permit conditions to incorporate the emission limits and permit conditions approved by U.S. EPA Region IV. We also request that the permit expiration date be extended to December 31, 1990, to accommodate the revised construction, start-up and environmental testing schedule.

Thank you for your continued assistance.

Sincerely

Walt Walters
President

Attachment

cc: J. M. Colvin, V.P., LGM

NRG/Recovery Group, Inc.
1616 Athens St. Lakeland, Florida 33803 813/687-4593

NRG/Recovery Group, Inc.

LAKE COUNTY
WASTE TO ENERGY FACILITY

Request For
Modification of Permit Conditions

LGM ENGINEERS CONSTRUCTORS

REQUEST FOR MODIFICATION OF PERMIT CONDITIONS

NRG/RECOVERY GROUP
LAKE COUNTY WASTE TO ENERGY FACILITY
LAKE COUNTY, FLORIDA

PERMIT NUMBERS: AC 35-115379
PSD-FL-113

RECEIVED
OCT 27 1987
Bureau of
Air Regulation

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1.0 INTRODUCTION

NRG/Recovery Group (NRG), a private developer, has been issued a permit to construct a 500 ton per day waste to energy facility. The facility will be located on a 15 acre site on Jim Rogers Road, Okahumpka, Florida, near Leesburg in Lake County.

The facility will burn unprepared municipal solid waste (MSW) in two municipal waste combustors (MWC) each having a rated capacity of 250 tons MSW per day. Each combustion furnace will have an integral water tube boiler to produce steam which will be used to generate electric power for sale.

The fuel supply is to be primarily Lake County domestic and commercial solid waste. As necessary, the fuel supply may be supplemented with wood chips or MSW from other areas.

The facility design is being modified to incorporate more stringent emissions control conforming to EPA's current design and performance criteria. This submittal is a request for modification of permit conditions to incorporate these changes.

2.0 REQUEST FOR MODIFICATION OF PERMIT CONDITIONS

On March 11, 1986, the NRG/Recovery Group applied to the Florida Department of Environmental Regulation (DER) for a Prevention of Significant Deterioration (PSD) Permit to Construct the Lake County Waste to Energy Facility.

On September 24, 1986, Florida DER issued its Final Determination and PSD permit for the proposed Lake County facility, Permit Numbers: AC 35-115379 and PSD-FL-113. The permit included specific stack emission limits which were proposed to be met with the use of a high efficiency electrostatic precipitator (ESP). The permit further required that space be provided to allow for the retrofit of additional acid gas and air pollutant emission control equipment, as may be required by subsequent rule. No adverse environmental impact from the proposed facility was projected, however, Florida and U.S. EPA were discussing rulemaking that might require retrofit of acid gas controls to existing facilities.

EPA objected to the permit not requiring the inclusion of acid gas control with the initial construction. On June 3, 1987, EPA-Region IV issued an Administrative Order requiring that NRG not commence any on-site construction activity until it has received a PSD permit that incorporates acid gas control and more stringent emission limitations for sulfur dioxide and particulate matter in accordance with the EPA determination of best available control technology (BACT).

LGM Engineers Constructors, as agent for NRG, has negotiated with EPA to develop specific permit conditions which include emission limits that EPA determines to be BACT for the Lake County facility. The specific EPA approved conditions are contained in Appendix A of this document. These conditions include acid gas control requirements and more stringent limits than those in the present permit for four criteria pollutants: particulate matter, sulfur dioxide, carbon monoxide and lead. The proposed limits for nitrogen oxides is less stringent than that under the present permit

based on a determination of BACT for contemporary municipal waste combustors designed to operate at higher temperature and combustion efficiency. The conditions also include minor adjustments to the BACT limits for the non-criteria pollutants.

EPA has informed NRG that a new order will be issued that supersedes the order of June 3, 1987, and allows NRG to commence construction under the following conditions: NRG may commence construction if the facility is designed and intended to conform to the emission limitations and conditions in Appendix A and NRG applies to Florida DER to have the PSD permit of September 24, 1986, amended to incorporate the emission limitations and conditions in Appendix A.

NRG proposes to incorporate acid gas control and more efficient particulate emission control into the facility design. It is requested that Florida modify the PSD permit conditions to incorporate the design and operating conditions and emission limits included in Appendix A and approved by EPA-Region IV as meeting BACT.

This document constitutes an application for modification of permit conditions in the PSD permit to construct. The report is formatted as an amendment to and revision of the earlier application submittals. Information contained in this document includes the following:

1. A review of the facility description and changes to the air pollution control equipment.

2. Revised Construction Schedule

3. Potential air pollutant emissions under proposed limits.

4. Review of conformance with Best Available Control Technology (BACT) requirements for the applicable air pollutants.

5. Effect of revised emission limits on air quality impact analysis.

6. Proposed specific conditions for inclusion in modified permit, Appendix A.

7. Original DER Form 17-1.202(1), Application to Operate/Construct Air Pollution Sources with revisions as noted.

3.0 PROJECT DESCRIPTION

General

NRG/Recovery Group of Lakeland, Florida is the project developer. LGM Engineers Constructors is to provide turn-key construction of the facility and is responsible for design, construction and startup of the facility. A qualified operations and maintenance company is to operate and maintain the facility.

Site Description

There are no significant changes from the originally proposed facility site description. The facility is to be located in Jim Rogers Industrial Park off Florida State Road 33 approximately three-quarters of a mile southeast of the community of Okahumpka and five miles south of Leesburg. The site includes 15.24 acres within the property boundary and is in a rural location bound by land that was primarily dedicated to citrus groves. The facility itself is confined to approximately 6 acres within the overall property site with the remaining property utilized for percolation pounds and buffer zone areas.

Process Description

Waste will be received from municipal and contractor trucks principally on a five day a week basis. Trucks will discharge waste into an enclosed pit. Combustion air fans will take suction from the enclosed unloading and waste pit area to aid in ventilation and provide dust and odor control.

The fuel supply will be Lake County MSW supplemented, as necessary, with wood chips or MSW from other areas. A change from the earlier design is the addition of an auxiliary fuel burner to each unit. The burner will have an approximate heat input capacity of 25 million BTU per hour firing distillate fuel oil or gas (e.g. natural gas or propane). The auxiliary fuel

burner will be used to preheat the boiler and supplement waste fuel during startup and at such time as is needed to maintain proper furnace temperature.

The two boiler systems will be supplied by Babcock and Wilcox. The combustion system for each boiler will consist of a waste hopper, hydraulic ram feeder and reciprocating grates supplied by Detroit Stoker.

The design rated capacity of each unit shall be 250 tons MSW per day and 60,200 pounds of steam per hour assuming a heating value of 5,000 BTU per pound of MSW. Steam conditions will be 650 psig and 755°F with a feed water temperature of 228°F. The maximum operating rate shall not exceed 115 percent of design rated capacity.

The steam from the two boilers will be used to generate power with a single extraction-condensing turbine generator having a nominal capacity of 12.4 megawatts.

Emission Controls

The present permit to construct allows the use of an electrostatic precipitator to control emissions. It further requires space to be provided in the layout for the retrofit of acid gas emission control equipment, if required by subsequent rule. The allowable particulate emission limit is 0.020 grains/dscf corrected to 12 percent CO_2.

NRG proposes to revise the design to include acid gas and SO_2 control and more efficient particulate emission control that will conform to EPA's determination of BACT. EPA has specifically identified a dry alkaline scrubber followed by high efficiency particulate collection using a fabric filter or electrostatic precipitator as being "state-of-the-art" and BACT. Other devices having comparable performance may also qualify as BACT. EPA has further stated a limit of 0.015 grains/dscf for particulate emissions and a requirement that the acid gas control be designed to remove 90 percent of acid gases and 70 percent of sulfur dioxide.

LGM is evaluating several emission control concepts capable of meeting the BACT criteria with the most likely choice being a lime slurry spray dryer followed by a baghouse or ESP. Specific design information will be forwarded to DER as it is developed.

Project Schedule

The start of construction has been delayed pending resolution of environmental issues. It is anticipated that construction could start in December, 1987, or soon thereafter, and be completed in the first quarter of 1990. To accommodate construction, startup and environmental testing and permitting, it is requested that the construction permit expiration date be extended to December 31, 1990.

4.0 PROPOSED MODIFICATION OF PERMIT CONDITIONS

The proposed permit conditions incorporating EPA-Region IV requirements for PSD are included in Appendix A.

Proposed Emission Limits

The following emission limits for regulated pollutants are proposed, with the agreement of EPA-Region IV, as appropriate BACT emission limits for the Lake County facility. Averaging time periods are given for those pollutants for which continuous emission monitoring systems (CEMS) will be employed.

TABLE 1

Proposed Emission Limits

Particulate:	0.015 grains/dscf corrected to 12% CO_2.
Sulfur Dioxide:	60 ppmdv corrected to 12% CO_2 (6-hour average); or 70% reduction of uncontrolled SO_2. Not to exceed 120 ppmdv (6-hour average).
Nitrogen Oxides:	385 ppmdv corrected to 12% CO_2.
Carbon Monoxide:	200 ppmdv corrected to 12% CO_2 (4-hour average).
VOC:	70 ppmdv as carbon corrected to 12% CO_2.
Lead:	3.1×10^{-4} grains/dscf corrected to 12% CO_2.
Fluoride:	1.5×10^{-3} grains/dscf corrected to 12% CO_2.
Beryllium:	2.0×10^{-7} grains/dscf corrected to 12% CO_2.
Mercury:	3.4×10^{-4} grains/dscf corrected to 12% CO_2.
Visible Emission:	15% opacity 20% opacity, one 6-minute period per hour.

The particulate limit of 0.015 grains/dscf is based upon the EPA determination of BACT. Sulfur dioxide emissions shall be limited to 60 ppmdv, 6-hour rolling average, or 70% reduction of noncontrolled SO_2. A new operating limit exceeding 60 ppm may be established upon a demonstration that the limit constitutes a 70% reduction of uncontrolled SO_2. The maximum emission concentration of 120 ppmdv may not be exceeded without permit revision.

The proposed limit of 385 ppmdv for NO_x is an increase from the present permit limit, which is based on emissions data from older design waste incinerators. The higher limit is appropriate for contemporary units designed to operate at higher combustion temperatures and with lower organic matter and carbon monoxide emissions.

The CO limit of 200 ppmdv, 4-hour rolling average, is a reduction from the present limit of 400 ppmdv, 8-hour rolling average and is a more appropriate standard.

High removal efficiencies for trace metals, acid gases and organics using a dry alkaline scrubber and particulate control have been corroborated, and the technology is deemed to be BACT. However, few data are available and best judgement has been used in establishing the proposed trace element emission limits. Should it be determined after facility performance testing that the control equipment meets the design criteria defining BACT, but that trace element limits are exceeded due to local waste characteristics, it may be necessary to revise the limits in the operating permit.

Design, Test, Monitoring and Reporting Conditions

Additional permit conditions have been agreed to which address design and operations. The design rated capacity is 250 tons MSW per day, 104 million BTU input per hour and 60,200 pounds steam output per hour with MSW having a heating value of 5,000 BTU per pound. This is the same as initially proposed and permitted. The maximum throughput shall not exceed 115% of the design rated values: 288 tons MSW per day, 120 million BTU input per hour, or 69,000 pounds steam output per hour. Auxiliary fuel burners firing distillate fuel oil or gas (e.g. natural gas or propane) shall be incorporated into the design and shall be used at startup.

Acid gas control equipment shall be designed to remove 90% of acid gases and 70% of SO_2 and to be capable of cooling flue gases to an average temperature not exceeding 300°F.

Tests for lead and VOC shall be added to the required initial compliance tests, and SO_2 emission reduction shall be determined.

Continuous emission monitoring for sulfur dioxide shall be added to the requirement for monitoring opacity, oxygen, carbon monoxide and carbon dioxide. Average CO and SO_2 emission concentrations, corrected for CO_2, shall be computed in accordance with the appropriate averaging times in the emission limits.

Devices shall be installed to monitor and record steam production, furnace exit gas temperature and flue gas temperature at the exit of the acid gas control equipment. The furnace heat load shall be maintained between 80% and 115% of the design rated capacity. The lower limit may be extended provided conformance with carbon monoxide and furnace temperature criteria are achieved.

Excess emissions reports shall be submitted for any calendar quarter during which there are excess emissions.

5.0 EMISSIONS AND BACT

Comparison of Present and Proposed Emission Limits

The present emission limits are expressed in several different units of measurement: grains per dry standard cubic foot, pounds per ton MSW, pounds per hour, ppmdv, and grams per day. We suggest that the permit limits all be in units of concentration, either grains/dscf or ppmdv corrected to 12% CO_2. Table 2 compares the proposed allowable emission rates with present emission limits.

Annual Emissions Potential and PSD Applicability

Table 3 provides the annual emissions potential under the proposed permit conditions and the existing permit conditions and the net change. Under the proposed limits the facility is subject to PSD BACT requirements for particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, lead, fluoride, beryllium and mercury.

The addition of acid gas control, more efficient particulate control and better combustion control results in a decrease in emissions for all criteria pollutants except nitrogen oxides, and no additional air quality analysis is required for those pollutants beyond that performed in the initial review. For nitrogen oxides an increase in the allowable emission rate is requested which results in a significant increase in annual emissions above that presently permitted. An analysis of air quality under the proposed NO_x emission limits is required.

Table 2

COMPARISON OF PRESENT AND PROPOSED EMISSION LIMITS PER UNIT

Pollutant	Proposed Permit			Existing Permit	Change	
	Limit	Potential Emission		Potential		
	ppm or gr/dscf (a)	@ 100% lb/hr[1] (b)	@ 115% lb/hr (c)	@100% lb/hr (d)	(b-d) lb/hr (e)	(c-d) lb/hr (f)
Particulate	0.015 gr/dscf	3.3	3.8	4.7 (0.020 gr/dscf)	-1.4	-0.9
SO_2[2]	60 ppmdv	15.5	17.8	29.2	-13.7	-11.4
	120 ppmdv	31.0	35.6	29.2 (58.4)	1.8 (-27.4)	6.4 (-22.8)
NO_x	385 ppmdv	71.8	82.5	52.1	19.7	30.4
CO	200 ppmdv	22.7	26.1	46.9 (400 ppmdv)	-24.2	-20.8
VOC	70 ppmdv	3.4	3.9	4.2	-0.8	-0.3
Lead	3.1×10^{-4} gr/dscf	0.069	0.079	0.1	-0.03	-0.02
Fluoride	1.5×10^{-3} gr/dscf	0.33	0.38	0.63	-0.30	-0.25
Beryllium	2.0×10^{-7} gr/dscf	4.5×10^{-5}	5.1×10^{-5}	1.04×10^{-5}	3.5×10^{-5}	4.1×10^{-5}
Mercury[3]	3.4×10^{-4} gr/dscf	0.076	0.087	0.147	-0.21	-0.20
H_2SO_4[4]		<0.42	<0.42	0.42	<0	<0

1. Conversion from concentration to mass emission rate assumes F_c = 1,800 scf $CO_2/10^6$ BTU for MSW fuel.
2. Proposed SO_2 limit: 60 ppm maximum expected emission.
   120 ppm maximum allowed after 70% control without permit revision.
   Existing permit: 29.2 lb/hr 30-day rolling average 58.4 lb/hr short term maximum.
3. Present mercury limit 3,200 grams/day
4. No H_2SO_4 limit is proposed.

Table 3

ANNUAL SITE EMISSION POTENTIAL AT 100% CAPACITY FACTOR

Pollutant	PSD Significant ton/yr	Proposed Permit ton/yr	Existing Permit ton/yr	Change ton/yr
Particulate	25	29.2	41.2	-12.0
SO_2	40	136 (60 ppm) 271 (120 ppm)	256 256	-120 15
NO_x	40	629	456	173
CO	100	199	411	-212
VOC	40	30	37	-7
Lead	0.6	0.6	1.0	-0.4
Fluoride	3	3	5.6	-2.6
Beryllium	0.0004	0.0004	0.000092	0.0003
Mercury	0.1	0.67	1.29	-0.62
H_2SO_4	7	<3.6	3.6	<0

Discussion of Emission Limits and BACT

Particulate Matter

The most stringent particulate emission standard applicable to the Lake County facility is the new source performance standard, Subpart Db for industrial boilers larger than 100 million BTU/hr. The standard is 0.10 lb/million BTU (approximately 0.045 grains/dscf corrected to 12% CO_2). The present permit limit based on Florida DER's BACT determination is 0.020 grains/dscf corrected to 12% CO_2. EPA subsequently made a determination that 0.015 grains/dscf constitutes BACT. NRG acknowledges that 0.015 grains/dscf can be attained, but with more costly control equipment than originally proposed. NRG proposes to modify its design to meet the EPA determination of BACT.

Sulfur Dioxide

There is no applicable sulfur dioxide standard. The present permit limits are 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. It was projected that no acid gas control equipment would be required to meet the permit limits. It is EPA's determination that a dry alkaline scrubber or comparable control device designated to remove 70% of uncontrolled sulfur dioxide emissions constitues BACT. NRG proposes to modify its design to meet emission limits of 60 ppmdv corrected to 12% CO_2 or 70% emission reduction. Outlet gas sulfur dioxide emissions will be monitored. Below 60 ppmdv no demonstration of control efficiency will be required after initial testing, and it is projected that conformance with the 60 ppmdv standard can be maintained, based on estimates of uncontrolled emissions. Should waste composition be such or become such that controlled emissions exceed 60 ppmdv, the mean uncontrolled sulfur dioxide emission may be determined and a new ppm limit established based on 70% reduction. The maximum controlled emission proposed to be allowed under this permit modification is 120 ppmdv.

Nitrogen Oxides

There is no applicable nitrogen oxides emission standard. The present permit limits are 5.0 lb/ton or 52.1 lb/hr, which equates to approximately 280 ppmdv corrected to 12% CO_2. This is the emission level estimated and proposed as a limit in the original application submittal of March, 1986. At the time of application submittal there were little data available with regard to NO_x emission levels being experienced by modern refuse burning facilities using state-of-the-art mass burn technology. Many of the older facilities for which emissions data were available were neither designed nor operated to achieve the high degree of combustion efficiency that the Lake County facility is designed to achieve. BACT design requires higher temperatures and combustion efficiency to accomplish the important objective of reduced carbon monoxide emissions and potentially harmful products of incomplete combustion. These emission reduction benefits are achieved to the detriment of NO_x emissions.

It appears that the Lake County facility using state-of-the-art combustion technology would have difficulty maintaining compliance with a limit of 280 ppm. A modification of permit conditions is requested to adjust the permissible NO_x emission level to 385 ppmdv corrected to 12% CO_2.

Ogden Projects recently submitted to Florida DER test data for units recently constructed in Europe and the U.S. Test results ranged from 311 ppm at 12% CO_2 to 385 ppm. Babcock and Wilcox reports a similar range of results. An emission level of 385 ppm is believed to be achievable and constitutes BACT for the Lake County facility.

NO_x emissions will not be monitored. Emission levels will be determined by a performance test in accordance with reference test methods.

Carbon Monoxide

There is no applicable carbon monoxide emission standard. The present permit limit is 400 ppmdv corrected to 12% CO_2, 8 hour average. It is believed that the facility will be capable of better performance, and 200 ppm is proposed as a more appropriate BACT standard. It is requested that the CO emission limit be adjusted to 200 ppmdv corrected to 12% CO_2, 4 hour rolling average. CO emissions will be monitored.

VOC

There is no applicable emission standard for VOC. Modern combustion technology provides BACT for VOC emissions. It is requested that the permit emission limit be revised to 70 ppmdv as carbon corrected to 12% CO_2. This is essentially the same as or a slight reduction from the present limit of 0.40 lb/ton.

BACT for Trace Elements: Lead, Fluoride, Beryllium, Mercury

There are no applicable emission standards for lead, fluoride, beryllium or mercury emissions from MSW incineration. EPA has determined that acid gas control which reduces flue gas temperature followed by high efficiency particulate control constitutes BACT for these elements that are found in trace amounts in MSW. Very little emissions data are available for these pollutants, and what data are available shows a high range of variability, especially for beryllium. As trace contaminants from unknown sources in MSW, the uncontrolled and controlled trace element flue gas concentrations will probably tend to vary significantly with the waste source and with time. The proposed emission limits for lead, fluoride and beryllium result in potential annual emissions just at the PSD significant levels. The proposed lead and fluoride emission limits are each less than the present limit. The proposed beryllium limit is a slight increase from the present limit. The proposed mercury limit is approximately half the present limit. Initial performance tests for each of the trace element contaminants will be conducted to determine emission levels.

Sulfuric Acid Mists

Very few data are available on sulfuric acid emissions from MSW incineration. The reaction of SO_2 to sulfuric acid mist is highly dependent upon variable combustion conditions and prediction of uncontrolled emissions is difficult. The proposed acid gas control is accepted as BACT for acid mists. EPA reports that due to test interferences no acceptable test method exists for measuring sulfuric acid mist emissions from MSW incinerators. Since compliance with a limit can not be determined, and since acid gas control will reduce the sulfuric acid emission to less than the PSD significant level, we propose that no emissions limit for sulfuric acid mist be included in the revised permit.

Unregulated HCl and Organic Pollutants

NRG proposes that the state-of-the-art combustion technology and acid gas and particulate control constitutes BACT for HCl and organic pollutant emissions. Combustion controls have been found to be effective and the primary mechanism for controlling potentially toxic organic pollutants. A few data are available showing that further reduction of organic pollutants is provided by acid gas and particulate control equipment.

6.0 AIR QUALITY IMPACT OF PERMIT MODIFICATION REQUEST

Nitrogen oxides is the only pollutant for which a significant increase in the allowable emission is requested and review of ambient air quality impact is required. For nitrogen oxides there is no PSD increment value and only an annual NAAQS.

For purposes of this review the results of the ISCST model runs performed for the original application were used. The ambient concentration was estimated by scaling the model results by the ratio of requested emission rate to the modeled emission rate.

The estimated air quality impact of NO_x emissions is given in Table 4. As can be seen, the estimated impact from the Lake County facility is approximately one percent of the annual NO_x NAAQS. One stack gas parameter has changed and could cause a slight adjustment in the predicted ambient impact values. The stack gas temperature will be reduced to 300°F or less with the acid gas control equipment, and the modeled temperature was 350°F. In light of the very low concentration estimates, it is clearly evident that the emissions from the facility in no way threaten an exceedance of the NAAQS, and no adjustment to the model input parameters was made.

Table 4

AIR QUALITY IMPACT OF REQUESTED NO_X EMISSION LEVELS

	Existing Permit	Requested Permit	
		@ 100%	@ 115%
NO_x ppmdv @ 12% CO_2	280	385	385
NO_x grams/sec	13.1	18.0	20.7
Annual Impact mg/m^3	0.7	1.0	1.1
Annual NAAQS mg/m^3	100	100	100

APPENDIX A

PROPOSED PERMIT CONDITIONS

PERMITTEE
NRG/Recovery Group
Lake County, Florida

October 6, 1987
Proposed Modification of Permit Conditions
Application Date: March 11, 1986
Fla. DER Permit Date: September 29, 1986
Permit Numbers: AC 35-115379
PSD-FL-113

Specific Conditions

1. Municipal Waste Combustor Design

   a. Each of the two municipal waste combustors (MWC) shall have a design rated capacity of 250 tons municipal solid waste (MSW) per day, 104 million BTU input per hour and 60,200 pounds steam output per hour with MSW having a heating value of 5,000 BTU per pound.

   b. The maximum individual MWC throughput shall not exceed 288 tons per day, 120 million BTU per hour and 69,000 pounds stream per hour, (3 hour average).

   c. The design furnace mean temperature at the fully mixed zone of the incinerator shall be not less than 1,800°F.

   d. The normal operating range shall be 80% to 115% of design rated capacity.

   e. The MWC shall be fueled with municipal solid waste or wood chips. Other wastes or fuels shall not be burned without specific prior written approval of Florida DER.

   f. Auxiliary fuel burners shall be fueled only with distillate fuel oil or gas (e.g. natural gas or propane). The annual capacity factor for fuel oil or gas shall be less than 10 percent, as determined by 40 CFR 60.43b(d). If the annual capacity factor for fuel oil or gas is greater than 10 percent, the facility shall be subject to Part 60.44b standards for nitrogen oxides.

   g. Auxiliary fuel burner(s) shall be used at startup during introduction of MSW fuel until design furnace gas temperature is achieved.

2. Air Pollution Control Equipment Design

   a. Each MWC shall be equipped with a particulate emission control device.

   b. Each MWC shall be equipped with an acid gas control device designed to remove at least 90% of acid gases and 70% of SO_2.

   c. The acid gas emission control system shall be designed to be capable of cooling flue gases to an average temperature not exceeding 300°F (3 hour rolling average).

3. Flue gas emissions from each unit shall not exceed the following:

a.	Particulate:	0.015 grains/dscf corrected to 12% CO_2.
b.	Sulfur Dioxide:	60 ppmdv corrected to 12% CO_2 6-hour, rolling average; or 70% reduction of uncontrolled SO_2 emissions, 6-hour rolling average. Not to exceed 120 ppmdv corrected to 12% CO_2, 6-hour rolling average.
c.	Nitrogen Oxides:	385 ppmdv corrected to 12% CO_2.
d.	Carbon Monoxide:	200 ppmdv corrected to 12% CO_2, 4-hour rolling average.
e.	Volatile Organic Compounds:	70 ppmdv as carbon corrected to 12% CO_2.
f.	Lead:	3.1×10^{-4} gr/dscf corrected to 12% CO_2.
g.	Fluoride:	1.5×10^{-3} gr/dscf corrected to 12% CO_2.
h.	Beryllium:	2.0×10^{-7} gr/dscf corrected to 12% CO_2.
i.	Mercury:	3.4×10^{-4} gr/dscf corrected to 12% CO_2.
j.	Visible Emissions:	Opacity of MWC emissions shall not exceed 15% opacity (6-minute average), except for one 6-minute period per hour of not more than 20% opacity. Excess emissions resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions are minimized.

For each pollutant for which a continuous emission monitoring system is required in condition 5., the emission averaging time specified above shall be used to establish operating limits and reportable excess emissions.

Compliance with the permit emission limits shall be determined by EPA reference method tests included in 40 CFR Parts 60 and 61 and listed in Condition 4. of this permit or by equivalent methods approved by Florida DER.

For the purposes of establishing specific increment consumption for TSP and SO_2 at the facility, an hourly emission rate shall be established for each pollutant at the time of performance testing using flue gas flow rates (corrected to 12% CO_2 and prorated to 115% rated furnace capacities) and the applicable concentration limits established above for TSP and SO_2.

The units are subject to 40 CFR 60, Subpart E and Subpart Db, New Source Performance Standards (NSPS), except where requirements of the permit are more restrictive, the requirements of the permit shall apply.

4. Compliance Tests

   a. Initial compliance tests for particulate matter, SO_2, nitrogen oxides, CO, VOC, lead, fluorides, mercury and beryllium shall be conducted in accordance with 40 CFR 60.8 (a), (b), (d), (e) and (f).

   b. Annual compliance test(s) for particulate matter and nitrogen oxides shall be performed. Test(s) may be performed in the common stack.

   c. Compliance with the opacity standard shall be determined in accordance with 40 CFR 60.11 (b) and (e).

   d. Compliance with the requirement for 70% control of total sulfur dioxide emissions will be determined by using the test methods in Condition 4.e. below or a continuous emission monitoring system for SO_2 emissions before and after the air pollution control equipment which meets the requirements of Performance Specification 2 of 40 CFR Appendix B.

   e. The following test methods and procedures of 40 CFR Parts 60 and 61 or equivalent methods having prior approval of Florida DER shall be used for compliance testing:

      (1) Method 1 for selection of sample site and sample traverses.

      (2) Method 2 for determining stack gas flow rate.

      (3) Method 3 or 3A for gas analysis for calculation of percent O_2 and CO_2.

      (4) Method 4 for determining stack gas moisture content to convert the flow rate from actual standard cubic feet to dry standard cubic feet.

(5) Method 5 or Method 17 for concentration of particulate matter.

(6) Method 9 for visible determination of the opacity of emissions as required in this permit in accordance with 40 CER 60.11.

(7) Method 6, 6C or Method 8 for concentration of SO_2.

(8) Method 7, 7A, 7B, 7C, 7D or 7E for concentration of nitrogen oxides.

(9) Method 10 for determination of CO concentration.

(10) Method 12 for determination of lead concentration.

(11) Method 13B for determination of fluoride concentrations.

(12) Method 25 or 25A for determination of VOC concentration.

(13) Method 101A for determination of mercury emission rate.

(14) Method 104 for determination of beryllium emission rate.

5. Continuous Emission Monitoring

Continuous emission monitors for opacity, oxygen, carbon monoxide, carbon dioxide, and sulfur dioxide shall be installed, calibrated, maintained and operated for each unit.

a. Each continuous emission monitoring system (CEMS) shall meet performance specifications of 40 CFR 60, Appendix B. The SO_2 CEMS sample point shall be located downstream of control devices for each unit.

b. CEMS data shall be recorded during periods of startup, shutdown and malfunction but shall be excluded from emission averaging calculations for CO, SO_2 and opacity.

c. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

d. The procedures under 40 CFR 60.13 shall be followed for installation, evaluation and operation of all CEMS.

e. Opacity monitoring system data shall be reduced to 6-minute averages, based on 36 or more data points, and gaseous CEMS data shall be reduced to 1-hour averages, based on 4 or more data points, in accordance with 40 CFR 60.13(h).

f. Average CO and SO_2 emission concentrations, corrected for CO_2, shall be computed in accordance with the appropriate averaging time periods included in Condition 3.

g. For purposes of reports required under this permit, excess emissions are defined as any calculated average emission concentration, as determined pursuant to Condition 5. herein, which exceeds the applicable emission limit in Condition 3.

6. Operations Monitoring

a. Devices shall be installed to continuously monitor and record steam production, furnace exit gas temperature (FEGT) and flue gas temperature at the exit of the acid gas control equipment. An FEGT to combustion zone correlation shall be established to relate furnace temperature at the temperature monitor location to furnace temperature in the overfire air fully mixed zone.

b. The furnace heat load shall be maintained between 80% and 115% of the design rated capacity during normal operations. The lower limit may be extended provided compliance with the carbon monoxide emissions limit and the FEGT within this permit at the extended turndown rate are achieved.

7. Reporting

a. Fifteen (15) days prior notification of compliance tests shall be given to the Florida DER district office.

b. The results of compliance tests shall be submitted to the Florida DER office within 45 days after completion of the tests.

c. The owner or operator shall submit excess emission reports for any calender quarter during which there are excess emissions from the facility. If there are no excess emissions during the calender quarter, the owner or operator shall submit a report semiannually stating that no excess emissions occurred during the semiannual reporting period. The report shall include the following:

(1) The magnitude of excess emissions computed in accordance with 40 CFR 60.13(h), any conversion factors used, and the date and time of commencement and completion of each period of excess emissions (60.7(c)(1)).

(2) Specific identification of each period of excess emissions that occurs during startups, shutdowns and malfunctions of the furnace boiler system. The nature and cause of any malfunction (if known) and the corrective action taken or preventive measures adopted (60.7(c)(2)).

(3) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks, and the nature of the system repairs or adjustments (60.7(c)(3)).

(4) When no excess emissions have occurred or the continuous monitoring system has not been inoperative, repaired, or adjusted, such information shall be stated in the report (60.7(c)(4)).

(5) The owner or operator shall maintain a file of all measurements, including continuous monitoring systems performance evaluations; all continuous monitoring systems or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by this permit recorded in a permanent form suitable for inspection (60.7(d)).

APPENDIX B

REVISED APPLICATION

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION REVISIONS October 1987
Original Application March 11, 1986

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

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Waste-to-Energy Facility [X] New[1] [ ] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [X] Modification of Permit Conditions

COMPANY NAME: Lake County Waste to Energy Facility COUNTY: Lake

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) WTE Unit No. 1 and No.

SOURCE LOCATION: Street Jim Rogers Road City Okahumpka

UTM: East 413.12 km North 3179.26 km

Latitude 28 ° 44 ' 22 "N Longitude 81 ° 53 ' 23 "W

APPLICANT NAME AND TITLE: NRG/Recovery Group (owner)

APPLICANT ADDRESS: 1616 Athens Street, Lakeland, Florida 33803

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of NRG/Recovery Group

I certify that the statements made in this application for a construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: J. Michael Colvin

J. Michael Colvin, Vice Pres., LGM Engineers Constructors
Name and Title (Please Type)

Date: 10/21/87 Telephone No. (813) 687-4593

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

- Symbol # signifies October 1987 revisions of data submitted in original application of March 11, 1986. Revised data is stricken through.

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed C P Nichols

C. P. Nichols
Name (Please Type)

Lockwood Greene Engineers, Inc.
Company Name (Please Type)

1330 W. Peachtree Street, Atlanta, GA 30367
Mailing Address (Please Type)

Florida Registration No. 30845 Date: 10/21/87 Telephone No. (404) 873-3261

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

The Lake County Waste to Energy Facility proposes to install a new municipal solid waste (MSW) conversion facility with capacity to burn 500 tons/day to generate steam and electric power. Two incinerator/boilers will be installed each having 250 tons/day capacity. Discharge is to one stack. (see attached description)

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction ~~July 1986~~ # December 1987 Completion of Construction ~~December 1987~~ # December 1990

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

~~Electrostatic Precipitator and associated equipment and erection~~ ~~$2,000,000.~~ # Acid gas control and particulate control approximate cost $4,000,000.

Continuous emissions monitoring systems $300,000.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

~~None.~~ # Florida DER Permit Numbers AC 35-115379 and PSD-FL-113, issuance date September 19, 1986, expiration date May 31, 1988. U.S. EPA Administrative Order June 3, 1987, requiring modification of PSD Permit.

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr_____; if seasonal, describe: Not seasonal.

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? No.

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No.

G. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No.

   a. If yes, for what pollutants? _____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

Supportive information is attached.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Municipal solid waste; see subsection E. Fuels.

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1) Not Applicable.

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	# Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	# Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			units = lbs/hr	T/yr	
Particulate	7.6 ~~13.76~~	29.2 ~~60~~	0.10 lb./ 10^6BTU*	20.8	830+	3650	
Sulfur Dioxide	36 - 71 ~~125~~	136 - 271 ~~547~~	NA	NA	125	547	
NO_x	164 ~~184~~	625 ~~456~~	NA	NA	164 ~~184~~	625 ~~456~~	
CO	52 ~~93~~	198 ~~102~~	NA	NA	52 ~~93~~	198 ~~102~~	
Pb	0.16 ~~0.25~~	0.6 ~~1.1~~			6.25	27	

* proposed 40CFR60 Subpart Db.

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard.

[4] Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency (%)	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
~~ESP~~ ESP or Baghouse	Particulate	~~99.5~~ 99+		Vendor Experience
Acid Gas Control	SO_2	70%		
	HCl	90%		

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Municipal solid waste	35,000 lb./hr	41,667 lb./hr	208 (104 x 10^6BTU/hr. each
Wood chips		11,500	50 (supplement MSW up to unit capacity)
Propane or distillate oil	startup or		25 MMBTU/hr per unit
	supplement to MSW		

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: Design MSW

Percent Sulfur: 0.3 Percent Ash: 20.1

Density: _____ lbs/gal Typical Percent Nitrogen: 0.8

Heat Capacity: 5000 BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): Chlorine

F. If applicable, indicate the percent of fuel used for space heating. Not Applicable.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Grate ash and flyash are wetted and mixed to prevent fugitive dust and disposed of in the Astatula landfill. Noncontact cooling water and boiler system blowdown is disposed of by percolation ponds.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 125 ft. Stack Diameter: 6' effective ft.

Gas Flow Rate: ~~111,000~~ # 130,000 ACFM _____ DSCFM Gas Exit Temperature: ~~350°(a)~~ # <300 °F.

Water Vapor Content: ~~9~~ # 20 % Velocity: ~~66~~ # 75 FPS

(a.) Lowest estimate for vendor equipment under consideration.

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish) *	Type II (Refuse) *	Type III (Garbage) *	Type IV (Pathological) **	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated		* Facility capacity is a total of 20.83 tons/hr. of Type I, II and III.			** Type IV to be incinerated only with the specific approval of Fla. DER and in accordance with approved procedures.		
Uncontrolled (lbs/hr)	SEE III						

Description of Waste Residential and commercial municipal solid waste.

Total Weight Incinerated (lbs/hr) 41,666 Design Capacity (lbs/hr) 41,666

Approximate Number of Hours of Operation per day 24 day/wk 7 wks/yr. 52

Manufacturer ~~to be determined~~ # Babcock & Wilcox boiler, Detroit Stoker grate

Date Constructed ~~7/86 to 12/87~~ Model No. to be determined

Each Unit	Volume $(ft)^3$	Heat Release (BTU/hr) Rated	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber	10,000 +	104 x 10^6	MSW	104 X 10^6	1800° 1 sec. +
~~Secondary Chamber~~				(120 max.)	1500° 3 sec.

Stack Height: 125 ft. Stack Diamter: 6' effective Stack Temp. ~~350°F~~ # 300°F

Gas Flow Rate: ~~111,000~~ # 130,000 ACFM ~~53300 @ 12% CO_2~~ DSCFM* Velocity: ~~66~~ # 75 FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[X] Other (specify) ~~ESP~~ # Acid gas control followed by Baghouse or ESP

Brief description of operating characteristics of control devices:

~~Three field dry electrostatic precipitator, rigid frame type; guaranteed emission rate less than 0.03 grains particulate/dscf corrected to 12% CO_2.~~

Proposed: Lime slurry spray dryer followed by baghouse or ESP.

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

See Section 8.

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)] N/A
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[X] Yes [ ] No See PSD report.

Contaminant	Rate or Concentration
Particulate	0.08 grains/dscf (Subpart E)
Particulate	0.10 lb./million BTU input (Subpart Db ~~proposed~~)

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[X] Yes [ ] No See PSD report, BACT/LAER Compilation

Contaminant		Rate or Concentration
Particulate	# 0.015 gr/dscf	~~0.02 to 0.05 gr/dscf~~
Sulfur Dioxide	# 60 ppm or 70% control	~~0.2 to 1.3 lb./million BTU~~
Nitrogen Oxides		0.3 to 0.7 lb./million BTU

C. What emission levels do you propose as best available control technology?

Contaminant	See PSD report	Rate or Concentration
Particulate	# 0.015 gr/dscf	~~0.03~~ gr/dscf corrected to 12% CO_2
Particulate		~~0.067 lb./million BTU~~ (0.032 lb/MMBTU)
Sulfur Dioxide	# 60 ppm or 70% control	~~0.6 lb./million BTU~~
Nitrogen Oxides	# 385 ppm	~~0.5 lb./million BTU~~ (0.7 lb/MMBTU)

D. Describe the existing control and treatment technology (if any). #

1. Control Device/System: Acid gas control ESP or baghouse 2. Operating Principles: ~~Electrostatic charge~~

3. Efficiency:* ~~98.5~~ 99% part 70% SO_2 4. Capital Costs: ~~$27,000,000~~ $4,300,000

Explain method of determining

5. Useful Life: 20 years +

6. Operating Costs: ~~$65,000/yr.~~ # $350,000

7. Energy: ~~50 kwh~~ # 350 kwh

8. Maintenance Cost: ~~$42,000/yr.~~ # $85,000

9. Emissions:

Contaminant	Rate or Concentration
Particulate # 0.015	~~0.03~~ gr./dscf corrected to 12% CO_2

10. Stack Parameters

a. Height: 125 ft.

b. Diameter: effective 6 ft.

c. Flow Rate: # 130,000 ~~111,200~~ ACFM

d. Temperature: # <300°F ~~350 °F~~.

e. Velocity: # 75 ~~66~~ FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1. See above.

a. Control Device: ESP

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See above

1. Control Device: ESP

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company: Pinellas County

(2) Mailing Address: Solid Waste Management, Pinellas County.

(3) City:

(4) State: Florida

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager: Bob Van Deman

(6) Telephone No.: (813) 825-1565

(7) Emissions:[1]

Contaminant	Rate or Concentration
Particulate	<0.03 gr/dscf corrected to 12% CO_2.

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data None

1. _____ no. sites _____ TSP _____ ( ) SO^{2*} _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded Refer to PSD permit application report for discussion on ambient monitoring exemption.

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. 5 Year(s) of data from 01 / 01 / 74 to 12 / 31 / 78
month day year month day year

2. Surface data obtained from (location) Orlando, Florida

3. Upper air (mixing height) data obtained from (location) Tampa, Florida

4. Stability wind rose (STAR) data obtained from (location) N/A

C. Computer Models Used

1. ISCST - modified to include Modified? If yes, attach description.

2. EPA calm wind Modified? If yes, attach description.

3. adjustment method Modified? If yes, attach description.

4. Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	1.735	grams/sec
SO^2	15.8	grams/sec

E. Emission Data Used in Modeling See attached PSD report.

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

B. Chalfant
LGG

NRG/Recovery Group, Inc.

RECEIVED
MAR 3 19[illegible]
LGM ENGINEERS
CONSTRUCTORS

February 26, 1986

Mr. Robert C. Mayfield, P.E.
Division Manager - Energy Division
LGM Engineers Constructors, Inc.
1330 W. Peachtree St., N.W.
Atlanta, Georgia 30367

Dear Bob

Please consider this letter as your authority to represent NRG/Recovery Group, Inc. before the Florida Department of Environmental Regulation in the matter of permitting our Resource Recovery facility being built in Lake County, Florida.

Until rescinded, we have appointed both LGM and Lockwood Greene Engineers, Inc. to represent us in the application and negotiations for any and all business before the DER.

Cordially yours

Walt Walters

1616 Athens St. Lakeland, Florida 33803 813/687-4593

NRG/Recovery Group, Inc.

February 26, 1986

Mr. W. Barry Hall, P.E.
Senior Project Manager
Lockwood Greene Engineers, Inc.
1330 W. Peachtree St., N.W.
Atlanta, Georgia 30367

Dear Barry

Please consider this letter as your authority to represent NRG/Recovery Group, Inc. to and before the Florida Department of Environmental Regulation in the matter of permitting our Resource Recovery facility being built in Lake County, Florida.

Until rescinded we have appointed both Lockwood Greene and LGM Constructors, Inc. to represent us in the application and negotiations for any and all business before the DER.

Cordially yours

Walt Walters

1616 Athens St. Lakeland, Florida 33803 813/687-4593

LOCKWOOD GREENE
Planners/Engineers/Architects/Managers
Atlanta, Georgia

JOB NO. 85463.02
SHEET NO. ____
DATE 10/19/87
JOB NAME NRG, LAKE COUNTY
COMPUTED BY RVC
SUBJECT EMISSION RATES
CHECKED BY ____

CONVERSION FROM CONCENTRATION TO EMISSION RATE

ASSUMPTION: "F" FACTOR FOR MSW

$F_d = 9500$ dscf / 10^6 BTU

$F_c = 1800$ dscf CO_2 / 10^6 BTU

$$E = C_d F_d \left(\frac{20.9}{20.9 - O_2\%}\right) = C_d F_d \left(\frac{100\%}{CO_2\%}\right)$$

Particulate: 0.015 gr/dscf @ 12% CO_2

$$E = \left(\frac{0.015\ gr}{dscf}\right)\left(\frac{1\ lb}{7000\ gr}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$= 0.032$ lb/10^6 BTU

SO_2: 60 ppmdv

$$E = \left(\frac{60}{10^6}\right)\left(\frac{64\ lb/mole}{385\ dscf/mole}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$= 0.149$ lb/10^6 BTU

SO_2: 120 ppmdv

$E = 0.299$ lb/10^6 BTU

NO_x: 385 ppmdv

$$E = \left(\frac{385}{10^6}\right)\left(\frac{46\ lb/mole}{385\ dscf/mole}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$= 0.690$ lb/10^6 BTU

LOCKWOOD GREENE
Planners/Engineers/Architects/Managers
Atlanta, Georgia

JOB NO. 85463.02
SHEET NO.
DATE 10/19/87
JOB NAME NRG, LAKE
COMPUTED BY RVC
SUBJECT EMISSION RATES
CHECKED BY

CO: 200 ppmdv

$$E = \left(\frac{200}{10^6}\right)\left(\frac{28\ lb/mole}{385\ dscf/mole}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 0.218\ lb/10^6\ BTU$$

VOC: 70 ppmdv as Carbon

$$E = \left(\frac{70}{10^6}\right)\left(\frac{12\ lb/mole}{385\ dscf/mole}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 0.0327\ lb/10^6\ BTU$$

Lead: 3.1×10^{-4} gr/dscf

$$E = \left(\frac{3.1\times10^{-4}\ gr}{dscf}\right)\left(\frac{lb}{7000\ gr}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 6.6 \times 10^{-4}\ lb/10^6\ BTU$$

Fluoride: 1.5×10^{-3} gr/dscf

$$E = \left(\frac{1.5\times10^{-3}\ gr}{dscf}\right)\left(\frac{lb}{7000\ gr}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 3.2 \times 10^{-3}\ lb/10^6\ BTU$$

Beryllium: 2.0×10^{-7} gr/dscf

$$E = \left(\frac{2.0\times10^{-7}\ gr}{dscf}\right)\left(\frac{lb}{7000\ gr}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 4.3 \times 10^{-7}\ lb/10^6\ BTU$$

Mercury: 3.4×10^{-4} gr/dscf

$$E = \left(\frac{3.4\times10^{-4}\ gr}{dscf}\right)\left(\frac{lb}{7000\ gr}\right)\left(\frac{1800\ dscf}{10^6\ BTU}\right)\left(\frac{100\%}{12\%}\right)$$

$$= 7.3 \times 10^{-4}\ lb/10^6\ BTU$$