DEPARTMENT OF ENVIRONMENTAL REGULATION

# ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

| | Initial | Date |
|---|---|---|
| 1. TO: (NAME, OFFICE, LOCATION) Barry Andrews | | |
| 2. Bill Thomas | | |
| 3. | | |
| 4. | | |

REMARKS:

INFORMATION

- [ ] Review & Return
- [ ] Review & File
- [ ] Initial & Forward
- [ ]

DISPOSITION

- [ ] Review & Respond
- [ ] Prepare Response
- [ ] For My Signature
- [ ] For Your Signature
- [ ] Let's Discuss
- [ ] Set Up Meeting
- [ ] Investigate & Report
- [ ] Initial & Forward
- [ ] Distribute
- [ ] Concurrence
- [ ] For Processing
- [ ] Initial & Return

FROM: John Brown

DATE 6/22/87

PHONE

Resource Recovery Office
Room 521, 115 South Andrews Avenue
Fort Lauderdale, Florida 33301
(305) 357-6458

DER
JUN 19 1987
BAQM

June 16, 1987

Mr. Wayne Aronson
Air Program Branch
Environmental Protection Agency, Region IV
345 Courtland Street
Atlanta, Georgia 30365

RE: North Broward Resource Recovery Project (PSD-FL-112) -- Proposed Permit and Final Determination.

Dear Mr. Aronson,

Enclosed you will find a copy of the May 15, 1987, South Broward Resource Recovery Project PSD Permit and Final Determination (as amended by June 1, 1987 letter from Bruce Miller) marked in red to reflect North Broward Project differences. We would propose this as the PSD Permit and Final Determination for the North Broward Project.

I am also enclosing an extra set of Tables V-1 through V-5 for the Final Determination revised by Ken Kosky of KBN Engineering and Applied Sciences to reflect final emission limitations.

If you have any questions concerning our marked changes, then please give me a telephone call.

Sincerely yours,

Thomas M. Henderson
Project Director

cc: Celiene Bruce, Assistant County Administrator
Tim Smith, Greenberg Traurig Askew
Ken Kosky, KBN Engineering
Ron Mills, Malcolm Pirnie, Inc.
Pat Patton, Waste Management, Inc.
Steve Smallwood, FDER Air Bureau

PERMIT TO CONSTRUCT UNDER THE RULES FOR THE
PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY

Pursuant to and in accordance with the provisions of Part C, Subpart 1 of the Clean Air Act, as amended, 42 U.S.C. §7470 et. seq., and the regulations promulgated thereunder at 40 CFR §52.21, as amended at 45 Fed. Reg. 52676, 52735-41 (August 7, 1980),

North
~~South~~ Broward County Resource Recovery Facility

is, as of the effective date of this permit (PSD-FL-112) authorized to construct a resource recovery facility consisting of ~~three 863~~ Four 605 ton per day (maximum capacity) mass burn, municipal solid waste incinerators and appurtenances at the following location:

2700 Hilton Road (N.W. 48th Street)
Pompano Beach, Florida 33060
~~On a 248 acre tract at the southeast intersection of State Road 84 and U.S. Route 441 in~~ Unincorporated Broward County, Florida.

Upon completion of authorized construction and commencement of operation/production, this stationary source shall be operated in accordance with the emission limitations, sampling requirements, monitoring requirements and other conditions set forth in the attached Part I.-Specific Conditions and Part II.-General Conditions.

This permit is hereby issued on _____ 87 and shall become effective thirty (30) days after receipt hereof unless a petition for administrative review is filed with the Administrator during that time. If a petition is filed any applicable effective date shall be determined in accordance with 40 CFR §124.19(f)(1).

If construction does not commence within 18 months after the effective date of this permit, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time, this permit shall expire and authorization to construct shall become invalid.

This authorization to construct shall not relieve the owner or operator of the responsibility to comply fully with all applicable provisions of Federal, State, and local law.

June
~~May 15~~, 1987
Date Signed

Jack E. Ravan
Regional Administrator

6/1/87 corrected page

PART I. - Specific Conditions

1. Emission Limitations

a. Stack emissions from each unit shall not exceed the following:

Particulate: 0.0150 gr/dscf dry volume corrected to 12% $CO_2$.

Sulfur Dioxide: (1) 0.140 lb/mmBtu heat input and 60 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$); or

(2) 65% reduction of uncontrolled $SO_2$ emissions.* In no case shall the $SO_2$ emissions exceed 0.310 lb/mmBtu heat input and 124 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$).

The 124 ppm limit above shall be modified to reflect a new emission limit (in ppm) from the control device at 65% control efficiency. Within 18 months of start-up of operation, the County shall submit compliance tests that will be used to determine the new $SO_2$ emission limit (in ppm). The limit will be determined by observed average emission rate ($\bar{x}$) from the submitted compliance tests and will be statistically analyzed using the one tailed student T test ($t_{.05} = (\bar{x} - u)\sqrt{n}/s$) at the 95% confidence level to derive a mean emission rate (u), where s is the standard deviation of observed values n. The final operating $SO_2$ emission limit (in ppm) shall be this mean emission rate (u). This value shall be restricted to no more than 124 ppm or less than 60 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$).

Nitrogen Oxides: .560 lb/mmBtu heat input and 350 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$).

Carbon Monoxide: .090 lb/mmBtu heat input; 400 ppm (1-hr rolling average, dry volume, corrected to 12% $CO_2$); and 88 ppm (4-day rolling average, dry volume, corrected to 12% $CO_2$).

Lead: .00150 lb/mmBtu

Fluorides: .0040 lb/mmBtu

Beryllium: $9.30 \times 10^{-7}$ lb/mmBtu

Mercury: $7.50 \times 10^{-4}$ lb/mmBtu

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* Uncontrolled $SO_2$ emissions will be measured at the inlet to the acid gas control device.

Visible Emissions: Opacity of stack emissions shall not be greater than 15% opacity. Excess opacity resulting from startup or shutdown shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess opacity shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by EPA for longer duration.

Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during start-up or shutdown shall be prohibited.

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

There shall be no greater than 10% opacity for emissions from the refuse bunker and the ash handling and loadout. The potential for dust generation by ash handling activities will be mitigated by quenching the ash prior to loading in ash transport trucks. Additionally, all portions of the proposed facility, including the ash handling facility, which have the potential for fugitive emissions will be enclosed. Also, those areas which have to be open for operational purposes, (e.g., tipping floor of the refuse bunker while trucks are entering and leaving) will be under negative air pressure.

b. Only distillate fuel oil or natural gas shall be used in startup burners. The annual capacity factor for use of natural gas and oil, as determined by 40 CFR 60.43b(d), shall be less than 10%. If the annual capacity factor of natural gas is greater than 10%, then the facility shall be subject to §60.44b.

c. None of the ~~three~~ Four individual municipal solid waste incinerators shall be charged in excess of ~~323.6~~ 226.9 mmBtu/hr and ~~865~~ 605 tons per day MSW (11~~5~~8% rated capacity) nor produce in excess of ~~192,000~~ 129,500 lbs/hr of steam (3-hr rolling average).

d. Compliance Tests

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

b. Compliance with the opacity standard for the incinerator stack emissions in condition 1.a. of this part shall be determined in accordance with 40 CFR 60.11 (b) and (e).

c. Compliance with the emission limitation for 65% control of total sulfur dioxide emissions shall be determined by using the test methods in condition 1.d.(2) and sampling for $SO_2$ emissions before and after the acid gas control device. Continuous emissions data shall also be used to demonstrate compliance with the $SO_2$ concentration limits in condition 1.a. above.

(2) The following test methods and procedures for 40 CFR Parts 60 and 61 shall be used for compliance testing:

a. Method 1 for selection of sample site and sample traverses.

b. Method 2 for determining stack gas flow rate when converting concentrations to or from mass emission limits.

c. Method 3 for gas analysis for calculation of percent $O_2$ and $CO_2$.

d. Method 4 for determining stack gas moisture content to convert the flow rate from actual standard cubic feet to dry standard cubic feet for use in converting concentrations in dry gases to or from mass emission limits.

e. Method 5 for concentration of particulate matter and associated moisture content. One sample shall constitute one test run.

f. Method 9 for visible determination of the opacity of emissions.

g. Method 6 for concentration of $SO_2$. Two samples, taken at approximately 30 minute intervals, shall ~~contitute~~ constitute one test run.

h. Method 7 for concentration of nitrogen oxides. Four samples, taken at approximately 15 minute intervals, shall constitute one test run.

i. Method 10 for determination of CO concentrations. One sample constitutes one test run.

j. Method 12 for determination of lead concentration and associated moisture content. One sample constitutes one test run.

k. Method 13B for determination of fluoride concentrations and associated moisture content. One sample shall constitute one test run.

l. Method 101A for determination of mercury emission rate and associated moisture content. One sample shall constitute one test run.

m. Method 104 for determination of beryllium emission rate and associated moisture content. One sample shall constitute one test run.

2. Compliance with emission limitations specified in lb/mmBtu in conditions 1.a. and 1.c. of this part shall be determined by calculating an "F" factor in dscf/mmBtu corrected to 12% $CO_2$ using the boilers' efficiency (as determined by the calorimeter method contained in Attachment A during acceptance testing) and the measured steam production. Data obtained from test methods required in condition 1.d. of this part for compliance testing shall be used for the calculation of the "F" factor required by this condition.

3. Devices shall be installed to continuously monitor and record steam production. These devices shall be adequately maintained and operating during all periods of steam production.

4. The height of each boiler exhaust stack shall not be less than ~~59 m~~ 61.0 meters above ground level at the base of the stack.

5. Each incinerator boiler shall have a metal name plate affixed in a conspicuous place on the shell showing manufacturer, model number, type waste, rated capacity, and certification number.

6. The permittee must submit to EPA and DER, within fifteen (15) days after it becomes available to the County, copies of technical data pertaining to the incinerator boiler design, acid gas control equipment design, particulate control equipment design, and the fuel mix that will be used to evaluate compliance of the facility with the preceeding emission limitations.

7. Fuel

   The Resource Recovery Facility shall utilize refuse such as garbage and trash (as defined in Chapter 17-7, FAC) but not grease, scum, grit screenings or sewage sludge.

8. Air Pollution Control Equipment

   The permittee shall install, continuously operate, and maintain the following air pollution controls to minimize emissions. Controls listed shall be fully operational upon startup of the proposed equipment.

   a. Each boiler shall be equipped with a particulate emission control device for the control of particulates.

   b. Each boiler shall be equipped with an acid gas control device designed to remove at least 90% of the acid gases.

9. Continuous Emission Monitoring

   a. Prior to the date of startup and thereafter, the County shall install, maintain, and operate the following continuous monitoring systems for each boiler exhaust stack:

      (1) Continuous emission monitoring (CEM) systems to measure stack gas opacity and $SO_2$, $NO_x$, CO, $CO_2$, and $O_2$ concentrations for each unit.

Continuous monitors for $SO_2$ shall be installed after the acid gas control device for each unit. The systems shall meet the EPA monitoring performance specifications of 40 CFR 60.13 and 40 CFR 60, Appendix B, during initial compliance testing and annually thereafter. Additionally, CEM's shall meet the quality control requirements of 40 CFR 60, Appendix F (Attachment B).

(2) CEM data recorded during periods of startup, shutdown, and malfunction shall be reported but excluded from compliance averaging periods for CO, $NO_x$, and opacity.

(3) a. CEM data recorded during periods of startup and shutdown shall be excluded from compliance averaging periods for $SO_2$.

b. CEM data recorded during periods of acid gas control device malfunctions shall be excluded from compliance averaging periods for $SO_2$ provided that the preceeding thirty day period which ends on the last day of the malfunction period meets an average $SO_2$ emission limit equal to the $SO_2$ limit specified in condition 1.a. CEM data must be available for 90% of the operating time for this exemption to apply. A malfunction as used in this permit means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process 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.

b. An excess emissions report shall be submitted to EPA for every calendar quarter. 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 shall also be reported (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) County shall maintain a file of all measurements, including continuous monitoring systems performance evaluations; all continuous monitoring systems or monitoring device calibrartion 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)).

(6) Excess emissions shall be defined as any applicable period during which the average emissions of CO, $NO_x$, and/or $SO_2$, as measured by the continuous monitoring system, exceeds the CO, $NO_x$, and/or $SO_2$ maximum emission limit (in ppm) set for each pollutant in condition 1.a. above.

c. Excess emissions indicated by the CEM systems shall be considered violations of the applicable opacity limit or operating emission limits (in ppm) for the purposes of this permit provided the data represents accurate emission levels and the CEM's do not exceed the calibration drift (as specified in the respective performance specification tests) on the day when initial and subsequent compliance is determined. The burden of proof to demonstrate that the data does not reflect accurate emission readings shall be the responsibility of the permittee.

10. Reporting

a. A copy of the results of the compliance tests shall be submitted within forty-five days of testing to the DER Bureau of Air Quality Management, the DER Southeast Florida District Office, Broward County, and EPA Region IV.

b. Continuous emissions monitoring data shall be reported to the DER Southeast District Office and EPA Region IV on a quarterly basis in accordance with Section 17-2.710, FAC, and 40 CFR 60.7.

c. Addresses for submitting reports are:

EPA Region IV

Chief, Air Compliance Branch
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Florida Department of Environmental Regulation (DER)

Deputy Chief, Compliance and Ambient Monitoring
Bureau of Air Quality Management
Florida Department of Environmental
Regulation (DER)
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Southeast District Office of DER

District Manager
Department of Environmental Regulation
3301 Gun Club Road
P.O. Box 3858
West Palm Beach, Florida 33402

Broward County

Broward County Environmental Quality
Control Board
500 Southwest 14th Court
Ft. Lauderdale, Florida 33315

PART II. - General Conditions

1. The permittee shall comply with the notification and record-keeping requirements codified at 40 CFR Part 60.7. In addition, the permittee shall provide EPA with 30 days notice prior to conducting any compliance testing required under condition 1.a.

2. The permittee shall retain records of all information resulting from monitoring activities and information indicating operation parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

3. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide EPA with the following information in writing within five (5) days of such condition:

   (a) description of noncomplying emission(s),
   (b) cause of noncompliance,
   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,
   (d) steps taken by the permittee to reduce and eliminate the noncomplying emission.

   Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of the aforementioned information does not constitute a waiver of the emission limitations contained within this permit.

4. Any proposed change in the information contained in the final determination regarding facility emissions or changes in the quantity or quality of materials processed that would result in new or increased emissions or ambient air quality impact must be reported to EPA. If appropriate, modifications to the permit may then be made by EPA to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein. Any contruction or operation of the source in material variance with the final determination shall be considered a violation of this permit.

5. In the event of any change in control of ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit and EPA of the change in control of ownership within 30 days.

6. The permittee shall allow representatives of the state and local environmental control agency or representatives of the EPA, upon presentation of credentials:

(a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of this permit;

(b) to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Clean Air Act;

(c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

(d) to sample at reasonable times any emissions of pollutants; and

(e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

7. The conditions of this permit are severable, and if any provision of this permit or the application of any provisions of this permit to any circumstances is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected.

Final Determination
and Permit Conditions

North ~~South~~ Broward County Resource Recovery Facility

Broward County, Florida

PSD-FL-~~105~~ 112

Prevention of Significant Deterioration

(40 CFR 52.21)

June ~~May 1~~, 1987

CONTENTS

February 1986

2700 Hilton Road
Pompano Beach,
Florida 33060
Unincorporated

## I. INTRODUCTION

Pursuant to Section 403.505, Florida Statutes, ~~South~~ North Broward Resource Recovery Project, Inc. (County), applied to the Florida Department of Environmental Regulation (DER) in ~~April 1985~~ for certification of a steam electric generating, solid waste energy recovery facility at ~~a site near the intersection of the U.S. Route 441 and State Road 84 in~~ Broward County, Florida. After a thorough review by DER, including public hearings, the Florida Power Plant Siting Board issued a site certification to the County. ~~At the time of the county's application, , FDER believed that such a site certification constituted a legal prevention of significant deterioration (PSD) permit under Chapter 17-2.500 of the Florida air pollution regulations which had been approved by the U.S. Environmental Protection Agency (EPA) on December 22, 1983.~~ In the summer of 1985, EPA became aware that the Florida Electrical Power Plant Siting Act (PPSA), under which the site certification was issued, restricts the authority of the State of Florida to implement any regulation (i.e., PSD Regulations) pertaining to power plants other than those in the Act. Consequently, EPA determined that the Florida PSD regulations were superseded by the PPSA, and that the PPSA could not legally be approved by EPA as part of the State Implementation Plan (SIP) since it did not comply with EPA PSD regulations both procedurally and substantively. Thus, EPA concluded that the proposed ~~South~~ North Broward County Resource Recovery Facility (RRF) could not be issued a valid PSD permit by FDER. Nor could the PPSA certification substitute for a valid PSD permit. EPA subsequently remanded PSD authority for sources subject to the PPSA while delegating responsibility for the technical and administrative portions of the PSD review to the FDER. The following final determination and permit constitute EPA's final action as well as the culmination of those activities delegated to the FDER by EPA.

At the time of its application to DER, County also filed a separate application for the Project with the United States Environmental Protection Agency (EPA) under Part C Subpart 1 of the Clean Air Act.

The applicant plans to construct a 2250 tons per day (TPD) solid waste-to-energy facility to be located ~~near the intersection of the U.S. Route 441 and State Road 84 in~~ Broward County, Florida. Municipal solid waste (MSW) will be combusted to produce steam for power generation. The present plans are to construct ~~three 750~~ four 550 TPD MSW incinerators. An ultimate maximum capacity of 3300 TPD is anticipated in the future which will require the addition of a ~~fourth~~ fifth and sixth incinerators. The ~~Broward~~ County ~~Resource Recovery Office~~ will need to submit an application to construct the ~~fourth~~ units at a future date. The applicant requests that each unit be permitted at ~~110~~ 110% of its rated capacity. At ~~110~~ 110% capacity, each of the ~~three~~ four energy recovery units will have an approximate heat input of ~~323.6~~ 226.9 million Btu per hour based on a heat content of 4500 Btu/lb for MSW. Each incinerator will be allowed to operate 8760 hours per year. The yearly tonnage of the various air pollutants emitted were calculated on this basis.

## II. RULE APPLICABILITY

The proposed site of the ~~South~~ North Broward County RRF is located within a nonattainment area for ozone. This designation requires that all proposed new sources which would emit greater than 100 tons per year (TPY) of volatile organic compound (VOC) be subject to nonattainment review. As the proposed incineration facility is projected to emit less than 100 TPY of VOC, the proposed source is not subject to a nonattainment review.

The source is subject to the regulations for PSD of air quality under 40 CFR 52.21 regarding the assessment of source emissions in attainment or unclassified areas. Since this source is within the category of stationary sources listed under the PSD regulations which specifies the threshold of emissions for PSD applicability as 100 TPY or greater of any regulated pollutant, the source must provide a Best Available Control Technology (BACT) determination, an ambient air quality analysis, a source impact analysis and an additional impact analysis (soils, vegetation, visibility) for each pollutant emitted in significant amounts. These include: particulate matter (PM), sulfur dioxide ($SO_2$), carbon monoxide (CO), nitrogen oxides ($NO_x$), lead (Pb), mercury (Hg), fluorides (as hydrogen fluoride, HF), and sulfuric acid mist. In addition to the above, a Class I area impact analysis is required because the source is to be located within 100 kilometers of the Everglades National Park.

New Source Performance Standards (NSPS) for incinerators under 40 CFR 60, subpart E, and Standards of Performance for Industrial-Commercial-Institutional Steam Generating under 40 CFR 60, subpart Db, apply to each unit within the proposed facility. These NSPS set emission standards for a broad category of sources and limit the maximum amounts of PM and $NO_x$ which may be emitted from any facility subject to these regulations.

## III. PSD APPLICABILITY DETERMINATION

Title 40 Code of Federal Regulations, Section 52.21 requires that each pollutant subject to PSD review must be controlled by BACT. Nine pollutants are subject to BACT. The BACT emission limits proposed are summarized as follows:

| Pollutant | BACT EMISSION LIMITS |
|---|---|
| Particulate Matter | 0.015 gr/dscf, corrected to 12% $CO_2$ |
| Sulfur Dioxide | 0.140 lbs/mmBtu or 65% removal (not to exceed 0.310 lb/mmBtu) |
| Nitrogen Oxides | 0.560 lb/mmBtu |
| Carbon Monoxide | 0.090 lb/mmBtu |
| Lead | 0.00150 lb/mmBtu |
| Mercury | $7.50 \times 10^{-4}$ lb/mmBtu |
| Beryllium | $9.30 \times 10^{-7}$ lb/mmBtu |
| Fluorides | 0.0040 lb/mmBtu |
| Sulfuric Acid Mist | 90% removal (not to exceed $4.70 \times 10^{-3}$ lb/mmBtu) |

*These emission limitations are based on the determination that BACT is control of acid gas emissions and a high degree of particulate emissions reduction.*

Based upon these air pollutant emission limits, the calculated total annual tonnage of regulated air pollutants emitted from the units to the atmosphere is listed as follows:

| Pollutant | | Maximum Annual Emissions (tons/year) | PSD Significant Emissions Rate (tons/year) |
|---|---|---|---|
| Particulate | (PM) | ~~164~~ 139 | 25 |
| Sulfur Dioxide | ($SO_2$) | ~~1318~~ 1232 | 40 |
| Nitrogen Dioxide | (NO) | ~~2381~~ 2225 | 40 |
| Carbon Monoxide | (CO) | ~~383~~ 358 | 100 |
| Lead | (Pb) | ~~6.4~~ 5.913 | 0.6 |
| Mercury | (Hg) | ~~3.2~~ 3.025 | 0.1 |
| Beryllium | (Be) | ~~0.0040~~ 0.0037 | 0.0004 |
| Fluorides | (F) | ~~17~~ 15.95 | 3 |
| Sulfuric Acid Mist | ($H_2SO_4$) | ~~20~~ 18.56 | 7 |

## IV. BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

### A. Particulate Matter

New Source performance standards for incinerators limit particulate emissions from these units to 0.08 grains per dry standard cubic foot (gr/dscf) based on a 12% flue gas concentration of carbon dioxide. NSPS for industrial-commercial-institutional steam generating units limit particulate emissions from these units to 0.10 lb/mmBtu or approximately 0.05 gr/dscf. However, BACT clearinghouse reports incinerators emission limits to be from 0.01 to 0.03 gr/dscf.

In making the BACT determination, an emissions limit was selected to ensure that hazardous yet unregulated pollutants are controlled in accordance with the North County, California, incinerator PSD remand. The control of dioxins, furans, and other condensible organics is hypothesized to occur due to their condensation and adsorption on particulate matter. As the collective surface area of fine particulate matter is greater than that of larger particles per mass unit and fine particulate matter consists of a significant portion of the total particulate matter, control equipment should be selected which ensures a high degree of control for fine particulates. EPA has agreed that the use of an electrostatic precipitator (ESP) can provide this high degree of control and the limit which was determined to be BACT is 0.015 gr/dscf. This results in an approximate increase in ESP annualized costs of $134,000 per year over the originally proposed emission limit of ~~0.03~~ gr/dscf, or a cost of $1,035 per ton of additional particulate removed. However, the applicant may install either an ESP or baghouse to meet this limitation. 0.02

Energy impacts are considered to be insignificantly affected by the increase in removal efficiency, and environmental benefit due to decreased emissions of unregulated hazardous pollutants is not assessable at this time.

### B. Sulfur Dioxide

The emissions of sulfur dioxide from municipal solid waste incinerators depend on three factors. These factors are: the sulfur content of the waste, the conversion of organic and inorganic sulfur compounds to sulfur dioxide, and the retention of the sulfur dioxide in the ash. This final determination assumes that all combined sulfur is converted and none is retained in the ash.

The applicant has reported the sulfur content of the waste to be 0.19 wt% maximum and 0.12 wt% average. This results in $SO_2$ emission rates of 7.6 to 4.8 lb/ton of MSW fired, or, at 4500 Btu/lb, 0.840 to 0.530 lb/mmBtu, respectively. Taking into account the selection of acid gas control devices (explained under acid gas BACT), the resultant emissions of sulfur dioxide

should be reduced by at least 65%. The emissions limit stipulated as BACT in the permit is 0.140 lb/mmBtu or a 65% reduction of sulfur dioxide emissions, not to exceed 0.310 lb/mmBtu. This limit was based on the emissions limits at other facilities and the variability of fuel sulfur content. Economic and environmental considerations are included under the acid gas BACT section.

C. Acid Gases

Acid gases consist primarily of sulfuric acid mist, hydrogen fluoride, and the unregulated pollutant hydrogen chloride. BACT for acid gas control was selected based on the North County remand which allows the consideration of unregulated pollutants in the assessment of BACT for regulated pollutants. The selection of 90% acid gas control includes the reduction of hydrogen chloride emissions in the economic analysis and the apparent reduction of condensible unregulated organic emissions (i.e., dioxins, furans) and heavy metals, due to the gas cooling effects of the acid gas control system proposed, in the environmental benefit analysis.

Sulfuric acid mist is generated as a result of the oxidation of sulfur dioxide to sulfur trioxide in the flue gas. Combination of sulfur trioxide and water results in the formation of sulfuric acid mists. The uncontrolled emissions of this pollutant are estimated to be as high as 200 TPY. BACT of 90% control of these emissions results in an emissions reduction of 180 TPY.

Hydrogen fluoride is created through the combustion of waste materials containing fluorine. Although the reported emissions of hydrogen fluoride vary greatly at existing facilities, the emissions have been reported to be as high as 0.02 lb/mmBtu. However, the applicant predicts an uncontrolled emission rate of 0.04 lb/mmBtu or 170 TPY at this facility. A 90% control efficiency for this pollutant results in the control of 153 TPY based on the agreed emission rate of 0.004 lb/mmBtu and is considered BACT.

The formation of hydrogen chloride emissions is due primarily to the combustion of plastics containing chlorine. It is assumed that the plastic content of municipal solid waste is 4.2 wt%, of which 11.2 wt% is PVC resin in plastics. Using the weight percent of chlorine in PVC (45.3 wt%), the expected uncontrolled emissions from this facility are 0.47 lb/mmBtu or 2013 tons per year. Acid gas control will provide control of 90% of these emissions of hydrogen chloride or 1993 TPY.

In assessing the economic impacts, 240 TPY of sulfur dioxide, 180 TPY of sulfuric acid mist, 153 TPY of hydrogen fluoride, and 1994 TPY of hydrogen chloride were used in determining the cost effectiveness of acid gas control. EPA studies have estimated that the cost of acid gas control for this facility to be approximately 3 million dollars in annualized costs. This results in a cost of $1169 per ton of total pollutants (listed above) and is considered reasonable.

The environmental benefits due to application of acid gas control are the reduction of the flue gas temperature for the condensation of dioxins, furans, pyrenes, biphenyls, and mercury which may then be removed by a high efficiency particulate control device. Even though the formation of the toxic organic compounds may be primarily due to the design and operation of the combustion device, studies show that the use of acid gas control and high efficiency particulate removal equipment is capable of achieving a 99+% reduction of the compounds formed. No acceptable levels of exposure to these compounds have been established by EPA and EPA is therefore obligated to ensure the public a minimal exposure to them.

D. Nitrogen Oxides

During combustion of municipal solid waste, $NO_x$ 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 $NO_x$ are the combustion temperatures and the concentration of oxygen. Techniques such as the method of fuel firing, correct distribution of combustion air between overfire and underfire air, exhaust gas recirculation, and decreased heat release rates have been used to reduce $NO_x$ emission. A few add-on control techniques such as catalytic reduction with ammonia and thermal de-$NO_x$ are still experimental and not considered to be demonstrated technology for the proposed project. State-of-the-art control of the combustion variables will be used to limit $NO_x$ emissions at 0.54 lb/mmBtu. This level of control is judged to represent BACT.

NSPS for industrial-commercial-institutional steam generating units regulates nitrogen oxide emissions for this facility if auxiliary fuels exceed 10% of the fuel input. Permit limits have been stipulated to ensure that auxiliary fuel input at each of the units will be less than 10%.

E. Carbon Monoxide

Incomplete combustion causes the emissions of solid carbon particles (e.g., smoke or soot) unburned and/or partially oxidized hydrocarbons and carbon monoxide, as well as resulting in the loss of heat energy. The applicant proposes that good equipment design and operation are BACT for carbon monoxide. Based on technical information relating good combustion practices and BACT determinations from other states, a limit of 0.090 lb/mmBtu is judged to represent BACT for carbon monoxide emissions.

F. Lead

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 500°F, and (2) consistently efficient removal of sub-micron fly ash particles. The maximum temperature of the incinerator combustion gases at the inlet to the particulate control device is estimated to be below 300°F. At this temperature the particulate control equipment would be capable of removing the lead emissions from the flue gas stream.

The emission limit judged to be reasonable for lead is based on test results at similar facilities and the degree of emission control that will be provided by the control equipment which has been determined to be BACT for this facility. In accordance with data contained in the California Air Resources Board (CARB) report on resource recovery facilities, the highest uncontrolled lead emission rate from refuse-fired incinerators tested is 0.037 lbs/mmBtu. Based on a heating value of 4500 Btu per pound of refuse and the control efficiency reported for lead emissions using the required BACT (scrubber and particulate control of 0.015 gr/dscf, corrected to 12% $CO_2$), an emission limitation of 0.00150 lb/mmBtu is judged to be BACT.

G. Mercury

BACT is determined to be or $7.50 \times 10^{-4}$ lb/mmBtu. This level of mercury emissions is judged to be reasonable based on test data from similar facilities and the degree of control that will be provided by the acid gas and particulate control equipment.

H. Beryllium

The uncontrolled emission of beryllium, according to the California report, when firing MSW is estimated to be $6.2 \times 10^{-6}$ lb/mmBtu. 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 300°F. Operation at this temperature will promote adsorption/condensation of beryllium oxides, present in the flue gas stream, onto available fly ash particulates for subsequent removal by the particulate control device. The annual beryllium emissions are estimated to be 0.004 TPY. This amount of beryllium emitted is considered to have a negligible impact on the environment. The emission limit of $9.3 \times 10^{-7}$ lb/mmBtu is judged to be BACT.

## V. AIR QUALITY ANALYSIS

The air quality impact of the proposed facility 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 of the criteria pollutants subject to BACT. Based on these analyses, EPA has reasonable assurance that the proposed solid waste recovery facility in South Broward County, subject to the BACT emission limitations, will not cause or contribute to a violation of any PSD increment or ambient air quality standard.

### A. Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. This model determines ground-level concentrations of gaseous and solid pollutants emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the wind, gaussian dispersion, and pollutant removal mechanisms such as deposition or transformation. The ISCST model also allows for the separation of sources, building wake downwash, and various other input and output features. Both screening and refined analyses were completed using this model, the source parameters in Table V-1 and emission rates in Table V-2.

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Table V-1. North Broward County Resource Recovery Facility Source Parameters

| Source (1) | UTM - E (km) | UTM - N (km) | Stack Height (M) | Exit Temp. (K) | Exit Velocity (M/S) | Stack Diameter (M) |
|---|---|---|---|---|---|---|
| Unit 1 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 2 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 3 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 4 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |

(1) Four 605 TPD incinerators, each with a flue to a common stack. For modeling purposes, the common stack was given a stack diameter of 3.0 m, and an exit velocity of 18.2 m/s.

(2) Estimated by using a flow rate of 68,260 ACFM for each unit and calculated using given diameters.

Table V-1

Broward County Resource Recovery Facility
Source Parameters

| Source (1) | UTM - E (km) | UTM - N (km) | Stack Height (m) | Exit Temp. (K) | Exit Velocity (m/s) | Stack Diameter (m) |
|---|---|---|---|---|---|---|
| Unit 1 | 579.6 | 2883.3 | 59.4 | 381 | 18.0 (2) | 2.29 |
| Unit 2 | 579.6 | 2883.3 | 59.4 | 381 | 18.0 (2) | 2.29 |
| Unit 3 | 579.6 | 2883.3 | 59.4 | 381 | 18.0 (2) | 2.29 |

(1) Three 750 TPD incinerators, each with a flue to a common stack. For modeling purposes the common stack was given a stack diameter of 5.03 meters and an exit velocity of 11.2 m/s, providing for a minimum flow rate.

(2) Estimated by using a flow rate of 157,000 ACFM for each unit and calculated using given diameters.

Substitute



Table V-2. North Broward County Resource Recovery Facility Maximum Emission Rates[a]

| Pollutant | (lb/ton) | (lb/MMBTU) | (PPM) | (lb/hr) | (ton/yr) |
|---|---|---|---|---|---|
| PM | 0.32 | 0.035 | -- | 31.8[b] | 101 |
| $SO_2$ | 2.8 | 0.31 | 124-60[c] | 281 | 896[c] |
| $NO_x$ | 5.04 | 0.56 | 350[d] | 508 | 1618 |
| CO | 0.81 | 0.090 | e | 262.5 | 260 |
| VOC | 0.12 | 0.013[f] | -- | 11.8 | 37.6 |
| Pb | 0.0135 | 0.0015 | -- | 1.36 | 4.3 |
| $F^-$ | 0.036 | 0.004 | -- | 3.63 | 11.6 |
| $H_2SO_4$ Mist[g] | 0.042 | 0.0047 | -- | 4.27 | 13.5 |
| Be | $8.4 \times 10^{-6}$ | $9.3 \times 10^{-7}$ | -- | 0.00084 | 0.0027 |
| Hg | 0.00675 | $7.5 \times 10^{-4}$ | -- | 0.68 | 2.2 |
| As | $2.8 \times 10^{-4}$ | 0.000031 | -- | 0.028 | 0.090 |

a. Based on facility capacity of 907.6 MMBTU/hr firing 2420 TPD of MSW, which is 110 percent of nameplate capacity. Maximum emissions in lb/hr calculated based on maximum ppm level if applicable. Maximum tons per year based on 80 percent annual availability factor of nameplate capacity and maximum lb/hr emission rate except for $NO_x$ and CO; these are based on maximum lb/MMBTU or lb/ton level.

b. Based on 0.015 gr/dscf corrected to 12% $CO_2$.

c. A maximum 3-hour rolling average corrected to 12% $CO_2$. A removal efficiency of 65% required. Actual tons per year will be between 890 and 431 depending on actual sulfur in MSW.

d. A maximum 3-hour rolling average corrected to 12% $CO_2$.

e. 400 ppm maximum 8-hour rolling average ppm and maximum 4 day rolling average of 130 ppm; corrected to 7% $O_2$, dry.

f. Covered under nonattainment provisions for $O_3$ and not applicable for PSD review.

g. Operating practice to reduce $SO_2$ (see c).

Table V-2
Broward County Resource Recovery Facility
Maximum Emission Rates (1)

| Pollutant | (lb/ton) | (lb/hr) | (ton/yr) |
|---|---|---|---|
| PM | 0.34 | 37.5 | 164 |
| $SO_2$ | 2.8 (2) | 302.9 | 1318 |
| $NO_x$ | 5.04 | 544 | 2381 |
| CO | 0.81 | 87.4 | 383 |
| Pb | 0.00135 | 1.46 | 6.4 |
| $F^-$ | 0.023 | 3.88 | 17.0 |
| Be | $8.4 \times 10^{-6}$ | 0.0009 | 0.0040 |
| Hg | 0.00675 | 0.73 | 3.2 |
| $H_2SO_4$ (3) | - | - | 20 |

(1) Based on facility capacity of 2588 TPD of MSW and emission limits.

(2) Based on a maximum emission rate of 0.31 lb/mmBtu at 65% removal efficiency.

(3) 90% removal (not to exceed $4.7 \times 10^{-3}$ lbs/mmBtu).

Five years of sequential hourly meteorological data were used in the modeling analyses. Both the surface and the upper air data used were National Weather Service data collected at Miami, Florida, during the period 1970-1974. Since five years of data were used, the highest, second-high, short-term predicted concentrations are compared with the appropriate short-term ambient standard or PSD increment. The highest predicted concentration were used for comparison with long-term standards (annual).

The initial set of screening model runs determined the highest, second-high concentrations, over a polar coordinate receptor grid with 36 radials, 10 degrees apart, and 10 downwind distances from 0.3 km to 4.3 km. Concentrations are predicted for the initial capacity of the facility. Additional refined modeling was completed for those days having the highest, second high concentrations using a refined receptor grid of several radials, two degrees apart and at seven distances, 100 meters apart, centered on the location of the previously determined highest, second-high value. In all of these runs, only the proposed RRF was modeled.

All of the modeling was completed using the $SO_2$ emission rate of the proposed facility. The impacts of the other emitted pollutants were determined by ratioing the emission rates to the $SO_2$ emission rate and multiplying by the $SO_2$ impact. Total ambient air quality impacts were based on the modeled impacts plus the monitored "background" concentrations.

The impact of the proposed facility on the Everglades National Park Class I area was also evaluated. Modeling was completed placing receptors along the edge of the Class I area using five years of meteorological data. The 17 receptor locations were spaced two kilometers apart along the northeast boundary of the park.

B. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality assured data using 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 EPA 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 area, then these data may be used at the discretion of the reviewing authority.

The predicted maximum air quality impacts of the proposed facility for those pollutants subject to PSD review are given in Table V-3. The monitoring de minimus level for each pollutant is also listed. Sulfuric acid mist and arsenic are not listed because there is no de minimus level for either of these pollutants. All pollutants have maximum predicted impacts below their respective de minimus values. Therfore, specific preconstruction monitoring is not required for any pollutant.

Table V-4 lists the measured ambient concentrations of all pollutants being currently monitored within 10 kilometers of the proposed facility. These values are used to estimate current background levels.

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Table V-3. North Broward County Resource Recovery Facility Maximum Air Quality Impacts Compared to the De Minimis Ambient Levels

| Pollutant and Averaging Time | Predicted Impact ($ug/m^3$) | De Minimis Ambient Impact Level ($ug/m^3$) |
|---|---|---|
| $SO_2$ (24-hour) | 4.4 | 13 |
| PM (24-hour) | 0.5 | 10 |
| $NO_2$ (Annual) | 1.1 | 14 |
| CO (8-hour)* | 11.1 | 575 |
| Pb (24-hour) | 0.02 | 0.1 (quarterly) |
| $F^-$ (24-hour) | 0.06 | 0.25 |
| Be (24-hour) | 0.00001 | 0.0005 |
| Hg (24-hour) | 0.011 | 0.025 |

* Based on an assumed maximum of 400 ppm, 8-hour average.

Table V-3

Broward County Resource Recovery Facility
Maximum Air Quality Impacts of the RRF
For Comparison to the De minimus Ambient Levels

| Pollutant and Averaging Time | Predicted Impact ($ug/m^3$) | De minimus Ambient Impact Level ($ug/m^3$) |
|---|---|---|
| $SO_2$ (24-hour) | 6.2 | 13 |
| PM (24-hour) | 0.8 | 10 |
| $NO_2$ (Annual) | 1.4 | 14 |
| CO (8-hour) (1) | 11.8 | 575 |
| Pb (24-hour) | 0.03 | 0.1 (quarterly) |
| $F^-$ (24-hour) | 0.081 | 0.25 |
| Be (24-hour) | 0.00002 | 0.0005 |
| Hg (24-hour) | 0.015 | 0.25 |

(1) Based on an assumed maximum of 200 ppm, 8-hour average emissions rate.

Substitute



Table V-4. North Broward County Resource Recovery Facility Nearest Monitoring Station to or Within 10 km of the RRF

| Site | Location with Respect to the Proposed Facility Direction (degrees) | Distance (km) | Pollutant | Concentration 1984 Annual ($ug/m^3$) | 24-Hour ($ug/m^3$) | 8-Hour ($ug/m^3$) | 1-Hour ($ug/m^3$) |
|---|---|---|---|---|---|---|---|
| 3700003 | 85 | 6.2 | PM | 36 | 63 | | |
| | | | Pb (quarterly) | 0.2 | | | |
| 3700002 | 14 | 6.1 | PM | 48 | 120 | | |
| 2270001 (G01) | 199 | 13.5 | PM | 38 | 76 | | |
| | | | $NO_2$ | 33 | | | |
| | | | $SO_2$ | 3 | 6 | | |
| | | | CO | | | 5 | 7 |
| 2270001 (G09) | 199 | 13.5 | PM | 38 | 76 | | |
| | | | $NO_2$ | 34 | | | |
| | | | $SO_2$ | 6 | 12 | | |
| 0420003 | 267 | 12.4 | $O_3$ | | | | 202 |
| 3700004 | 170 | 7.5 | CO | | | 5 | 7 |
| 2560002 | 232 | 6.5 | PM | 29 | 59 | | |
| | | | Pb (quarterly) | 0.1 | | | |

Table V-4

Broward County Resource Recovery Facility
Monitoring Data Within 10 km of the RRF

| Site | -Location with Respect to the Proposed Facility- Direction (degrees) | Distance (km) | Pollutant | Concentration 1984 Annual ($ug/m^3$) | 24-hour ($ug/m^3$) | 8-hour ($mg/m^3$) | 1-hour ($mg/m^3$) |
|---|---|---|---|---|---|---|---|
| 0420002 | 3° | 2.0 | CO | | | 10 | 17 |
| 0910002 | 296° | 3.8 | PM | 33 | 64 | | |
| | | | $NO_2$ | 28 | | | |
| | | | $SO_2$ | 3 | 4 | | |
| 1260004 | 55° | 6.8 | PM | 41 | 72 | | |
| | | | $NO_2$ | 29 | | | |
| | | | $SO_2$ | 4 | 28 | | |
| 1840001 | 158° | 6.9 | PM | 39 | 70 | | |
| | | | Pb (quarterly) | 0.2 | | | |
| 3530001 | 216° | 7.3 | $NO_2$ | 30 | | | |
| | | | $SO_2$ | 3 | 6 | | |
| 1260003 | 27° | 7.6 | PM | 59 | 93 | | |
| | | | $NO_2$ | 42 | | | |
| | | | $SO_2$ | 3 | 4 | | |
| | | | CO | | | 7 | 11 |
| | | | Pb (quarterly) | 0.9 | | | |
| 1840002 | 150° | 8.6 | CO | | | 6 | 10 |
| 3640002 | 334° | 9.4 | PM | 31 | 59 | | |

C. PSD Increment Analysis

The proposed Broward County RRF is to be located in a Class II area. This area is designated as an attainment area for both $SO_2$ and PM. A PSD increment analysis is therefore required to show compliance with the Class II increments.

The PSD increments represent the amount that new sources in the area may increase ambient ground-level concentrations of $SO_2$ and PM. At no time, however, can the increased loading of these pollutants cause or contribute to a violation of the ambient air quality standards.

All $SO_2$ and PM emission increases from sources constructed or modified after the baseline date (December 1977) will consume PSD increment. In addition, all $SO_2$ and PM emission increases associated with construction or modification of major sources which occurred after January 6, 1975, will consume increment. The proposed Broward County RRF is the only significant source in the area which will consume PSD increment for either $SO_2$ or PM.

Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed. The results of this modeling are summarized in Table V-5. The results indicate that the concentration increases are within the allowable amounts.

A Class I area increment analysis is required because of the proposed facility is located within 100 kilometers (57 km) of the Everglades National Park, a designated Class I area. Although the distance to the Class I area is greater than 50 kilometers (the distance to which the models are generally considered valid), the applicant used the model to estimate the impact on this area. The results indicate a less than significant impact.

D. AAQS Analysis

Given existing air quality in the area of the proposed facility, emissions from the new facility are not expected to cause or contribute to a violation of an AAQS. Table V-6 shows the results of the AAQS analysis.

The results showed that, with the exception of $SO_2$ and lead, the maximum impacts of the other criteria pollutants were less than the significant impact levels defined in 40 CFR 52.21. As such, no further modeling analysis was completed for PM, $NO_x$, and CO. For $SO_2$, additional modeling was performed which included the interaction of surrounding sources of $SO_2$. For lead, there is no significant impact level defined in the regulation. However, no further modeling of lead was completed because the predominate sources of ambient lead in the area are mobile sources.

Table V-5. North Broward County Resource Recovery Facility Comparison of New Source Impacts with PSD Increments

| Pollutant and Averaging Time | PSD Class II Analysis | | | PSD Class I Analysis | | |
|---|---|---|---|---|---|---|
| | PSD Class II Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) | Percent Increment Consumed | PSD Class I Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) | Percent Increment Consumed |
| $SO_2$* | | | | | | |
| 3-hour | 512 | 17.6 | 3 | 25 | 2 | 8 |
| 24-hour | 91 | 4.4 | 5 | 5 | 0.3 | 6 |
| Annual | 20 | <1 | <5 | 2 | <<1 | <<1 |
| PM | | | | | | |
| 24-hour | 37 | <1 | <3 | 10 | <1 | <1 |
| Annual | 19 | <<1 | <<5 | 5 | <<1 | <<1 |

* Based on a maximum emission of 281 lb/hr; actual emissions would likely be much lower based on 65% $SO_2$ removal efficiency.

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Table V-5

Broward County Resource Recovery Facility
Comparison of New Source Impacts with PSD Increments

| Pollutant and Averaging Time | PSD Class II Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) | Percent Increment Consumed | PSD Class I Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) |
|---|---|---|---|---|---|
| $SO_2$ | | | | | |
| 3-hour | 512 | 26 | 5 | 25 | 4 |
| 24-hour | 91 | 6 | 7 | 5 | 1 |
| Annual | 20 | <1 | <5 | 2 | <1 |
| PM | | | | | |
| 24-hour | 37 | <1 | <3 | 10 | <1 |
| Annual | 19 | <<1 | <<5 | 5 | <<1 |

Substitute



Table V-6. North Broward County Resource Recovery Facility Comparison of Total Impact with the AAQS

| Pollutant and Averaging Time | Maximum Impact Project ($ug/m^3$) | Maximum Impact (1) All Sources ($ug/m^3$) | Existing Background (2) ($ug/m^3$) | Maximum Total Impact ($ug/m^3$) | Florida AAQS ($ug/m^3$) |
|---|---|---|---|---|---|
| $SO_2$ | | | | | |
| 3-hour | 18 | 332 | 27 (3) | 359 | 1300 |
| 24-hour | 4 | 92 | 12 | 104 | 260 |
| Annual | <1 (4) | - | 6 | - | 60 |
| PM | | | | | |
| 24-hour | <1 (4) | - | 120 | - | 150 |
| Annual | <<1 (4) | - | 48 | - | 60 |
| $NO_2$ | | | | | |
| Annual | <1 (4) | - | 34 | - | 100 |
| CO | | | | | |
| 1-hour | 39 (4) | - | 7,000 | - | 40,000 |
| 8-hour | 10 (4) | - | 5,000 | - | 10,000 |
| Pb | | | | | |
| 3-months | <0.1 | - | 0.2 | - | 1.5 |

(1) Maximum impact includes the FPL Port Everglades and Fort Lauderdale power plants, and minor sources within 10 km of proposed facility.

(2) Existing background is estimated using the highest monitored concentrations in the area near the proposed facility.

(3) The 3-hour background is estimated by multiplying the 24-hour background by 2.25.

(4) Less than significant, no further analysis completed. For CO, analysis based on 400 ppm, 8-hour average.

Table V-6

Broward County Resource Recovery Facility
Comparison of Total Impact with the AAQS

| Pollutant and Averaging Time | Maximum Impact Project ($ug/m^3$) | Maximum Impact (1) All Sources ($ug/m^3$) | Existing Background (2) ($ug/m^3$) | Maximum Total Impact ($ug/m^3$) | National Ambient Air Quality Standard ($ug/m^3$) |
|---|---|---|---|---|---|
| $SO_2$ | | | | | |
| 3-hour | 26 | 625 | 63 (3) | 688 | 1300 |
| 24-hour | 6 | 216 | 28 | 244 | 260 |
| Annual | <1 (4) | - | 4 | - | 60 |
| PM | | | | | |
| 24-hour | <1 (4) | - | 93 | - | 150 |
| Annual | <<1 (4) | - | 59 | - | 60 |
| $NO_2$ | | | | | |
| Annual | 1.4 (4) | - | 42 | 43 | 100 |
| CO | | | | | |
| 1-hour | 64 (4) | - | 17,000 | - | 40,000 |
| 8-hour | 12 (4) | - | 10,000 | - | 10,000 |
| Pb | | | | | |
| 3-months | <0.1 | - | 0.9 | 1 | 1.5 |

(1) Maximum impact includes the FPL Port Everglades and Fort Lauderdale power plants.

(2) Existing background is estimated using the highest monitored concentrations in the area near the proposed facility.

(3) The 3-hour background is estimated by multiplying the 24-hour background by 2.25.

(4) Less than significant, no further analysis completed. For CO, analysis based on 400 ppm, maximum, 1-hour and assumed 200 ppm, maximum, 8-hour average emissions rate.

The total impact on ambient air is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes into account all sources of the particular pollutant in question that were not explicitly modeled. A conservative estimate of these "background" concentrations was made by using the highest monitored concentration for each pollutant as listed in Table V-4. This is a conservative estimate because sources used in the modeling may have contributed to the monitored value.

Based on this analysis, EPA has resonable assurance that no AAQS will be exceeded as a result of the operation of the proposed new resource recovery facility.

## VI. ADDITIONAL IMPACTS ANALYSIS

### A. Impacts on Soils and Vegetation

The maximum ground-level concentrations predicted to occur as a result of emissions from the proposed project in conjunction with all other sources, including background concentrations, will be at or below all applicable AAQS including the 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.

A summary of the types and quantities of soils and vegetation in and around the proposed RRF site area and in the Everglades National Park can be found in the Site Certification Application. The applicant has also compared predicted maximum impacts with known adverse impact levels for both criteria and noncriteria pollutants. No adverse impacts are expected.

### B. Impact on Visibility

A level I visibility screening analysis was performed to determine if any impact may occur in the Class I area. The analysis showed that there was no potential for an adverse impact on visibility in this area.

### C. Growth-Related Air Quality Impacts

The proposed 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 width, whichever is less. For the proposed project, a single common stack, housing the individual flues for each incinerator, will be ~~59.4~~ 61.0 meters high. This is below the allowed GEP stack height of 65 meters.

### E. Noncriteria Pollutants

The proposed facility emits in significant amounts (as defined in the PSD regulations): fluorides, sulfuric acid mist, beryllium, mercury, and arsenic. All of these pollutants are regulated, but there is no ambient air quality standards or PSD increments set for any of them. For three of these pollutants--fluorides, beryllium, and mercury--a de minimus ambient impact level has been defined. Exceedance of these levels, usually determined by dispersion modeling, is used to determine if ambient monitoring is necessary. The results of this modeling for these pollutants is listed in Table V-3. For each of these three pollutants, the predicted impact is less than their respective de minimus impact level.

F. Unregulated Pollutants

Two additional pollutants are often brought up in the context of resource recovery facilities. These are hydrogen chloride (HCl) and dioxins (2, 3, 7, 8-TCDD). Neither is currently regulated within the PSD regulations. Hydrogen chloride is regulated nationally for other type sources but not specifically for resource recovery facilities. Some states do regulate both of these substances. Both of these substances may become regulated either nationally or by the State in the future. The recommended control equipment necessary for the facility to meet the BACT emissions limitations for the regulated pollutants will also control HCl and dioxins.

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VII. FINAL PERMIT

PART I. - Specific Conditions

1. Emission Limitations

a. Stack emissions from each unit shall not exceed the following:

| | | |
|---|---|---|
| Particulate: | | 0.0150 gr/dscf dry volume corrected to 12% $CO_2$. |
| Sulfur Dioxide: | (1) | 0.140 lb/mmBtu heat input and 60 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$); or |
| | (2) | 65% reduction of uncontrolled $SO_2$ emissions.* In no case shall the $SO_2$ emissions exceed 0.310 lb/mmBtu heat input and 124 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$). |

The 124 ppm limit above shall be modified to reflect a new emission limit (in ppm) from the control device at 65% control efficiency. Within 18 months of start-up of operation, the County shall submit compliance tests that will be used to determine the new $SO_2$ emission limit (in ppm). The limit will be determined by observed average emission rate ($\bar{x}$) from the submitted compliance tests and will be statistically analyzed using the one tailed student T test ($t_{.05} = (\bar{x} - u)\sqrt{n}/s$) at the 95% confidence level to derive a mean emission rate (u), where s is the standard deviation of observed values n. The final operating $SO_2$ emission limit (in ppm) shall be this mean emission rate (u). This value shall be restricted to no more than 124 ppm or less than 60 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$).

| | |
|---|---|
| Nitrogen Oxides: | .560 lb/mmBtu heat input and 350 ppm (3-hr rolling average, dry volume, corrected to 12% $CO_2$). |
| Carbon Monoxide: | .090 lb/mmBtu heat input; 400 ppm (1-hr rolling average, dry volume, corrected to 12% $CO_2$); and 88 ppm (4-day rolling average, dry volume, corrected to 12% $CO_2$). |
| Lead: | .00150 lb/mmBtu |
| Fluorides: | .0040 lb/mmBtu |
| Beryllium: | $9.30 \times 10^{-7}$ lb/mmBtu |
| Mercury: | $7.50 \times 10^{-4}$ lb/mmBtu |

* Uncontrolled $SO_2$ emissions will be measured at the inlet to the acid gas control device.

Visible Emissions: Opacity of stack emissions shall not be greater than 15% opacity. Excess opacity resulting from startup or shutdown shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess opacity shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by EPA for longer duration.

Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during start-up or shutdown shall be prohibited.

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

There shall be no greater than 10% opacity for emissions from the refuse bunker and the ash handling and loadout. The potential for dust generation by ash handling activities will be mitigated by quenching the ash prior to loading in ash transport trucks. Additionally, all portions of the proposed facility, including the ash handling facility, which have the potential for fugitive emissions will be enclosed. Also, those areas which have to be open for operational purposes, (e.g., tipping floor of the refuse bunker while trucks are entering and leaving) will be under negative air pressure.

b. Only distillate fuel oil or natural gas shall be used in startup burners. The annual capacity factor for use of natural gas and oil, as determined by 40 CFR 60.43b(d), shall be less than 10%. If the annual capacity factor of natural gas is greater than 10%, then the facility shall be subject to §60.44b.

c. None of the ~~three~~ Four individual municipal solid waste incinerators shall be charged in excess of ~~923.6~~ 226.9 mmBtu/hr and ~~860~~ 605 tons per day MSW (115% rated capacity) nor produce in excess of ~~192,000~~ 129,500 lbs/hr of steam (3-hr rolling average).

d. Compliance Tests

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

b. Compliance with the opacity standard for the incinerator stack emissions in condition 1.a. of this part shall be determined in accordance with 40 CFR 60.11 (b) and (e).

c. Compliance with the emission limitation for 65% control of total sulfur dioxide emissions shall be determined by using the test methods in condition 1.d.(2) and sampling for $SO_2$ emissions before and after the acid gas control device. Continuous emissions data shall also be used to demonstrate compliance with the $SO_2$ concentration limits in condition 1.a. above.

(2) The following test methods and procedures for 40 CFR Parts 60 and 61 shall be used for compliance testing:

a. Method 1 for selection of sample site and sample traverses.

b. Method 2 for determining stack gas flow rate when converting concentrations to or from mass emission limits.

c. Method 3 for gas analysis for calculation of percent $O_2$ and $CO_2$.

d. Method 4 for determining stack gas moisture content to convert the flow rate from actual standard cubic feet to dry standard cubic feet for use in converting concentrations in dry gases to or from mass emission limits.

e. Method 5 for concentration of particulate matter and associated moisture content. One sample shall constitute one test run.

f. Method 9 for visible determination of the opacity of emissions.

g. Method 6 for concentration of $SO_2$. Two samples, taken at approximately 30 minute intervals, shall ~~contitute~~ one test run. constitute

h. Method 7 for concentration of nitrogen oxides. Four samples, taken at approximately 15 minute intervals, shall constitute one test run.

i. Method 10 for determination of CO concentrations. One sample constitutes one test run.

j. Method 12 for determination of lead concentration and associated moisture content. One sample constitutes one test run.

k. Method 13B for determination of fluoride concentrations and associated moisture content. One sample shall constitute one test run.

l. Method 101A for determination of mercury emission rate and associated moisture content. One sample shall constitute one test run.

m. Method 104 for determination of beryllium emission rate and associated moisture content. One sample shall constitute one test run.

2. Compliance with emission limitations specified in lb/mmBtu in conditions 1.a. and 1.c. of this part shall be determined by calculating an "F" factor in dscf/mmBtu corrected to 12% $CO_2$ using the boilers' efficiency (as determined by the calorimeter method contained in Attachment A during acceptance testing) and the measured steam production. Data obtained from test methods required in condition 1.d. of this part for compliance testing shall be used for the calculation of the "F" factor required by this condition.

3. Devices shall be installed to continuously monitor and record steam production. These devices shall be adequately maintained and operating during all periods of steam production.

4. The height of each boiler exhaust stack shall not be less than ~~39.4~~ 61.0 meters above ground level at the base of the stack.

5. Each incinerator boiler shall have a metal name plate affixed in a conspicuous place on the shell showing manufacturer, model number, type waste, rated capacity, and certification number.

6. The permittee must submit to EPA and DER, within fifteen (15) days after it becomes available to the County, copies of technical data pertaining to the incinerator boiler design, acid gas control equipment design, particulate control equipment design, and the fuel mix that will be used to evaluate compliance of the facility with the preceeding emission limitations.

7. Fuel

   The Resource Recovery Facility shall utilize refuse such as garbage and trash (as defined in Chapter 17-7, FAC) but not grease, scum, grit screenings or sewage sludge.

8. Air Pollution Control Equipment

   The permittee shall install, continuously operate, and maintain the following air pollution controls to minimize emissions. Controls listed shall be fully operational upon startup of the proposed equipment.

   a. Each boiler shall be equipped with a particulate emission control device for the control of particulates.

   b. Each boiler shall be equipped with an acid gas control device designed to remove at least 90% of the acid gases.

9. Continuous Emission Monitoring

   a. Prior to the date of startup and thereafter, the County shall install, maintain, and operate the following continuous monitoring systems for each boiler exhaust stack:

      (1) Continuous emission monitoring (CEM) systems to measure stack gas opacity and $SO_2$, $NO_x$, CO, $CO_2$, and $O_2$ concentrations for each unit. Continuous monitors for $SO_2$ shall be installed after the acid gas control device for each unit. The systems shall meet the EPA monitoring performance specifications of 40 CFR 60.13 and 40 CFR 60, Appendix B, during initial compliance testing and annually thereafter. Additionally, CEM's shall meet the quality control requirements of 40 CFR 60, Appendix F (Attachment B).

      (2) CEM data recorded during periods of startup, shutdown, and malfunction shall be reported but excluded from compliance averaging periods for CO, $NO_x$, and opacity.

(3) a. CEM data recorded during periods of startup and shutdown shall be excluded from compliance averaging periods for $SO_2$.

b. CEM data recorded during periods of acid gas control device malfunctions shall be excluded from compliance averaging periods for $SO_2$ provided that the preceeding thirty day period which ends on the last day of the malfunction period meets an average $SO_2$ emission limit equal to the $SO_2$ limit specified in condition 1.a. CEM data must be available for 90% of the operating time for this exemption to apply. A malfunction as used in this permit means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process 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.

b. An excess emissions report shall be submitted to EPA for every calendar quarter. 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 shall also be reported (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) County shall maintain a file of all measurements, including continuous monitoring systems performance evaluations; all continuous monitoring systems or monitoring device calibrartion 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)).

(6) Excess emissions shall be defined as any applicable period during which the average emissions of CO, $NO_x$, and/or $SO_2$, as measured by the continuous monitoring system, exceeds the CO, $NO_x$, and/or $SO_2$ maximum emission limit (in ppm) set for each pollutant in condition 1.a. above.

c. Excess emissions indicated by the CEM systems shall be considered violations of the applicable opacity limit or operating emission limits (in ppm) for the purposes of this permit provided the data represents

accurate emission levels and the CEM's do not exceed the calibration drift (as specified in the respective performance specification tests) on the day when initial and subsequent compliance is determined. The burden of proof to demonstrate that the data does not reflect accurate emission readings shall be the responsibility of the permittee.

10. Reporting

a. A copy of the results of the compliance tests shall be submitted within forty-five days of testing to the DER Bureau of Air Quality Management, the DER Southeast Florida District Office, Broward County, and EPA Region IV.

b. Continuous emissions monitoring data shall be reported to the DER Southeast District Office and EPA Region IV on a quarterly basis in accordance with Section 17-2.710, FAC, and 40 CFR 60.7.

c. Addresses for submitting reports are:

EPA Region IV

Chief, Air Compliance Branch
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Florida Department of Environmental Regulation (DER)

Deputy Chief, Compliance and Ambient Monitoring
Bureau of Air Quality Management
Florida Department of Environmental
Regulation (DER)
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Southeast District Office of DER

District Manager
Department of Environmental Regulation
3301 Gun Club Road
P.O. Box 3858
West Palm Beach, Florida 33402

Broward County

Broward County Environmental Quality
Control Board
500 Southwest 14th Court
Ft. Lauderdale, Florida 33315

PART II. - General Conditions

1. The permittee shall comply with the notification and record-keeping requirements codified at 40 CFR Part 60.7. In addition, the permittee shall provide EPA with 30 days notice prior to conducting any compliance testing required under condition 1.a.

2. The permittee shall retain records of all information resulting from monitoring activities and information indicating operation parameters as specified in the specific conditions of this permit for a minimum of two (2) years from the date of recording.

3. If, for any reason, the permittee does not comply with or will not be able to comply with the emission limitations specified in this permit, the permittee shall provide EPA with the following information in writing within five (5) days of such condition:

   (a) description of noncomplying emission(s),
   (b) cause of noncompliance,
   (c) anticipated time the noncompliance is expected to continue or, if corrected, the duration of the period of noncompliance,
   (d) steps taken by the permittee to reduce and eliminate the noncomplying emission.

   Failure to provide the above information when appropriate shall constitute a violation of the terms and conditions of this permit. Submittal of the aforementioned information does not constitute a waiver of the emission limitations contained within this permit.

4. Any proposed change in the information contained in the final determination regarding facility emissions or changes in the quantity or quality of materials processed that would result in new or increased emissions or ambient air quality impact must be reported to EPA. If appropriate, modifications to the permit may then be made by EPA to reflect any necessary changes in the permit conditions. In no case are any new or increased emissions allowed that will cause violation of the emission limitations specified herein. Any contruction or operation of the source in material variance with the final determination shall be considered a violation of this permit.

5. In the event of any change in control of ownership of the source described in the permit, the permittee shall notify the succeeding owner of the existence of this permit and EPA of the change in control of ownership within 30 days.

6. The permittee shall allow representatives of the state and local environmental control agency or representatives of the EPA, upon presentation of credentials:

(a) to enter upon the permittee's premises, or other premises under the control of the permittee, where an air pollutant source is located or in which any records are required to be kept under the terms and conditions of this permit;

(b) to have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit, or the Clean Air Act;

(c) to inspect at reasonable times any monitoring equipment or monitoring method required in this permit;

(d) to sample at reasonable times any emissions of pollutants; and

(e) to perform at reasonable times an operation and maintenance inspection of the permitted source.

7. The conditions of this permit are severable, and if any provision of this permit or the application of any provisions of this permit to any circumstances is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected.

## VIII. PUBLIC COMMENTS/NOTICE

No public comments were received by the Florida DER during the public comment period, except for EPA-Region IV concerns regarding acid gas and particulate control. These concerns are incorporated in the final determination and permit as changes to the preliminary determination and final permit.

Table V-1. North Broward County Resource Recovery Facility Source Parameters

| Source (1) | UTM - E (km) | UTM - N (km) | Stack Height (M) | Exit Temp. (K) | Exit Velocity (M/S) | Stack Diameter (M) |
|---|---|---|---|---|---|---|
| Unit 1 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 2 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 3 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |
| Unit 4 | 583.6 | 2907.6 | 61.0 | 380 | 18.2 (2) | 1.5 |

(1) Four 605 TPD incinerators, each with a flue to a common stack. For modeling purposes, the common stack was given a stack diameter of 3.0 m, and an exit velocity of 18.2 m/s.

(2) Estimated by using a flow rate of 68,260 ACFM for each unit and calculated using given diameters.

Table V-2. North Broward County Resource Recovery Facility Maximum Emission Rates[a]

| Pollutant | (lb/ton) | (lb/MMBTU) | (PPM) | (lb/hr) | (ton/yr) |
|---|---|---|---|---|---|
| PM | 0.32 | 0.035 | -- | 31.8[b] | 101 |
| $SO_2$ | 2.8 | 0.31 | 124-60[c] | 281 | 896[c] |
| $NO_x$ | 5.04 | 0.56 | 350[d] | 508 | 1618 |
| CO | 0.81 | 0.090 | e | 262.5 | 260 |
| VOC | 0.12 | 0.013[f] | -- | 11.8 | 37.6 |
| Pb | 0.0135 | 0.0015 | -- | 1.36 | 4.3 |
| $F^-$ | 0.036 | 0.004 | -- | 3.63 | 11.6 |
| $H_2SO_4$ Mist[g] | 0.042 | 0.0047 | -- | 4.27 | 13.5 |
| Be | $8.4 \times 10^{-6}$ | $9.3 \times 10^{-7}$ | -- | 0.00084 | 0.0027 |
| Hg | 0.00675 | $7.5 \times 10^{-4}$ | -- | 0.68 | 2.2 |
| As | $2.8 \times 10^{-4}$ | 0.000031 | -- | 0.028 | 0.090 |

a. Based on facility capacity of 907.6 MMBTU/hr firing 2420 TPD of MSW, which is 110 percent of nameplate capacity. Maximum emissions in lb/hr calculated based on maximum ppm level if applicable. Maximum tons per year based on 80 percent annual availability factor of nameplate capacity and maximum lb/hr emission rate except for $NO_x$ and CO; these are based on maximum lb/MMBTU or lb/ton level.

b. Based on 0.015 gr/dscf corrected to 12% $CO_2$.

c. A maximum 3-hour rolling average corrected to 12% $CO_2$. A removal efficiency of 65% required. Actual tons per year will be between 890 and 431 depending on actual sulfur in MSW.

d. A maximum 3-hour rolling average corrected to 12% $CO_2$.

e. 400 ppm maximum 8-hour rolling average ppm and maximum 4 day rolling average of 130 ppm; corrected to 7% $O_2$, dry.

f. Covered under nonattainment provisions for $O_3$ and not applicable for PSD review.

g. Operating practice to reduce $SO_2$ (see c).

Table V-3. North Broward County Resource Recovery Facility Maximum Air Quality Impacts Compared to the De Minimis Ambient Levels

| Pollutant and Averaging Time | Predicted Impact ($ug/m^3$) | De Minimis Ambient Impact Level ($ug/m^3$) |
|---|---|---|
| $SO_2$ (24-hour) | 4.4 | 13 |
| PM (24-hour) | 0.5 | 10 |
| $NO_2$ (Annual) | 1.1 | 14 |
| CO (8-hour)* | 11.1 | 575 |
| Pb (24-hour) | 0.02 | 0.1 (quarterly) |
| $F^-$ (24-hour) | 0.06 | 0.25 |
| Be (24-hour) | 0.00001 | 0.0005 |
| Hg (24-hour) | 0.011 | 0.025 |

* Based on an assumed maximum of 400 ppm, 8-hour average.

Table V-4. North Broward County Resource Recovery Facility Nearest Monitoring Station to or Within 10 km of the RRF

| Site | Location with Respect to the Proposed Facility: Direction (degrees) | Distance (km) | Pollutant | Concentration 1984: Annual ($ug/m^3$) | 24-Hour ($ug/m^3$) | 8-Hour ($ug/m^3$) | 1-Hour ($ug/m^3$) |
|---|---|---|---|---|---|---|---|
| 3700003 | 85 | 6.2 | PM | 36 | 63 | | |
| | | | Pb (quarterly) | 0.2 | | | |
| 3700002 | 14 | 6.1 | PM | 48 | 120 | | |
| 2270001 (G01) | 199 | 13.5 | PM | 38 | 76 | | |
| | | | $NO_2$ | 33 | | | |
| | | | $SO_2$ | 3 | 6 | | |
| | | | CO | | | 5 | 7 |
| 2270001 (G09) | 199 | 13.5 | PM | 38 | 76 | | |
| | | | $NO_2$ | 34 | | | |
| | | | $SO_2$ | 6 | 12 | | |
| 0420003 | 267 | 12.4 | $O_3$ | | | | 202 |
| 3700004 | 170 | 7.5 | CO | | | 5 | 7 |
| 2560002 | 232 | 6.5 | PM | 29 | 59 | | |
| | | | Pb (quarterly) | 0.1 | | | |

Table V-5. North Broward County Resource Recovery Facility Comparison of New Source Impacts with PSD Increments

| Pollutant and Averaging Time | PSD Class II Analysis | | | PSD Class I Analysis | | |
|---|---|---|---|---|---|---|
| | PSD Class II Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) | Percent Increment Consumed | PSD Class I Increment ($ug/m^3$) | Predicted Increased Concentration ($ug/m^3$) | Percent Increment Consumed |
| $SO_2$* | | | | | | |
| 3-hour | 512 | 17.6 | 3 | 25 | 2 | 8 |
| 24-hour | 91 | 4.4 | 5 | 5 | 0.3 | 6 |
| Annual | 20 | <1 | <5 | 2 | <<1 | <<1 |
| PM | | | | | | |
| 24-hour | 37 | <1 | <3 | 10 | <1 | <1 |
| Annual | 19 | <<1 | <<5 | 5 | <<1 | <<1 |

* Based on a maximum emission of 281 lb/hr; actual emissions would likely be much lower based on 65% $SO_2$ removal efficiency.

Table V-6. North Broward County Resource Recovery Facility Comparison of Total Impact with the AAQS

| Pollutant and Averaging Time | Maximum Impact Project ($ug/m^3$) | Maximum Impact (1) All Sources ($ug/m^3$) | Existing Background (2) ($ug/m^3$) | Maximum Total Impact ($ug/m^3$) | Florida AAQS ($ug/m^3$) |
|---|---|---|---|---|---|
| $SO_2$ | | | | | |
| 3-hour | 18 | 332 | 27 (3) | 359 | 1300 |
| 24-hour | 4 | 92 | 12 | 104 | 260 |
| Annual | <1 (4) | - | 6 | - | 60 |
| PM | | | | | |
| 24-hour | <1 (4) | - | 120 | - | 150 |
| Annual | <<1 (4) | - | 48 | - | 60 |
| $NO_2$ | | | | | |
| Annual | <1 (4) | - | 34 | - | 100 |
| CO | | | | | |
| 1-hour | 39 (4) | - | 7,000 | - | 40,000 |
| 8-hour | 10 (4) | - | 5,000 | - | 10,000 |
| Pb | | | | | |
| 3-months | <0.1 | - | 0.2 | - | 1.5 |

(1) Maximum impact includes the FPL Port Everglades and Fort Lauderdale power plants, and minor sources within 10 km of proposed facility.

(2) Existing background is estimated using the highest monitored concentrations in the area near the proposed facility.

(3) The 3-hour background is estimated by multiplying the 24-hour background by 2.25.

(4) Less than significant, no further analysis completed. For CO, analysis based on 400 ppm, 8-hour average.