Memorandum

Florida Department of
Environmental Protection

BAR

TO: Howard L. Rhodes

THRU: Clair Fancy CHF
Al Linero AAL 7/8

FROM: Joe Kahn JK

DATE: July 8, 1999

SUBJECT: Miami-Dade WASD Orr WTP
0250314-002-AC, PSD-FL-249

Attached for approval and signature is the final PSD permit for the standby diesel generators at Miami-Dade Water and Sewer Department's Alexander Orr, Jr. Water Treatment Plant. The applicant applied on April 27, 1998 (sufficient fee received on May 19, 1998) to the Department for an air construction permit for its Orr Water Treatment Plant Standby Diesel Engine Generators located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. A BACT determination was required for NOx. NOx emissions will be controlled by the use of fuel injection timing retardation and turbocharger aftercooling.

Total emissions of pollutants shall not exceed the following annual emission rates in tons per year: NOx, 403; PM/PM_{10}, 5.6; Sulfur dioxide, 5.0; VOC, 7.8; CO, 20.8.

An air quality impact analysis was conducted. Emissions from the facility will not cause or contribute to a violation of any state or federal ambient air quality standards.

The public notice requirements have been met by publishing in the Miami Daily Business Review on June 8, 1999.

I recommend your approval and signature.

Attachments

/jk

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Jorge S. Rodriguez, P.E.
Assistant Director, Water
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Coral Gables, Florida 33146-0316

DEP File No. 0250314-002-AC
PSD-FL-249
Alexander Orr, Jr. WTP
Standby Diesel Engine Generators
Miami-Dade County

Enclosed is Final Permit Number 0250314-002-AC, PSD-FL-249. This permit authorizes the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under section 120.68 of the Florida Statutes, by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 7-15-99 to the person(s) listed:

Mr. Jorge S. Rodriguez, P.E. *
Ms. Bertha Goldenberg, P.E.
Mr. David Lindberg, P.E., CH2M Hill
Mr. Isidore Goldman, P.E., DEP SED
Mr. Patrick Wong, P.E., DERM
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS

Clerk Stamp

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

7-15-99

(Clerk) (Date)

FINAL DETERMINATION

Miami-Dade Water and Sewer Department
John E. Preston WTP, Standby Diesel Engine Generators
DEP File No. 0250281-006-AC, PSD-FL-248

The Department distributed a public notice package on April 22, 1999 to allow the applicant to increase operation of four existing diesel engine generators at its Alexander Orr, Jr. WTP to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. The Orr WTP is located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The Public Notice of Intent to Issue was published in the Miami Daily Business Review on June 8, 1999.

COMMENTS/CHANGES

No comments were received by the Department from the public, EPA or NPS/FWS.

Comments were received from the applicant by letter and e-mail.

The applicant suggested minor changes to the Technical Evaluation to fix a typographical error, to refer to the generators as "standby" generators throughout the document, and to clarify that the fuel sulfur content shall not exceed 0.05% by weight. The Department does not believe a revision of the Technical Evaluation is needed given that the applicant's comments will clarify the document, and because the permit clearly states that the sulfur limit is a maximum value.

The applicant suggested that the permit include the word "standby" in the description of the diesel engine generators in Section I and Section III of the permit for clarity. The Department will make this change.

The applicant reiterated that the notes associated with specific conditions 2 and 5 should not be construed as permit limitations, and suggested they be relocated within the permit or removed from the permit. The Department agrees that these are not intended to be limitations. They are clearly identified as notes and are worded so as to not be construed as limitations. The Department believes the notes are needed to summarize fuel consumption and potential emissions for future PSD applicability, and will keep them in the permit.

The applicant requested revision of specific condition 7 to clarify that the applicant may demonstrate compliance with the fuel sulfur content limit by receiving records from the fuel supplier that states the sulfur content of the fuel delivered. The Department intended that the applicant could demonstrate compliance in this manner, so it agrees with this request and will clarify the language of this condition.

CONCLUSION

The final action of the Department is to issue the permit with the changes described above.

Z 333 618 199

US Postal Service

Receipt for Certified Mail

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Postage	$
Certified Fee	
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Return Receipt Showing to Whom & Date Delivered	
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PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:

- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a. and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Jorge Rodriguez, PE
Miami-Dade W & S Dept.
4200 Salzedo St.
Coral Gables, Fl
33146-0316

4a. Article Number
Z 333 618 199

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery 7/19/99

5. Received By: *(Print Name)*
Tina Acosta

6. Signature: *(Addressee or Agent)*
X Tina M. Acosta

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMITTEE

Miami-Dade Water and Sewer Department
Alexander Orr, Jr. WTP
4200 Salzedo Street
Coral Gables, Florida 33146-0316

Permit No.	0250314-002-AC, PSD-FL-249
Project	Diesel Engine Generators
SIC No.	4941
Expires:	July 8, 2000

Authorized Representative:

Jorge S. Rodriguez, P.E., Assistant Director, Water

PROJECT AND LOCATION

This permit authorizes Miami-Dade Water and Sewer Department to increase the operation of four existing diesel engine generators, and to modify the engines to comply with the emission limit specified by the BACT determination by retarding the fuel injector timing and installing turbocharger aftercoolers.

This facility is located at 6800 SW 87 Avenue, Miami, Miami-Dade County. UTM coordinates are: Zone 17; 566.6 km E and 2843.5 km N.

STATEMENT OF BASIS

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to construct/modify the emissions units in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

APPENDICES

The attached appendices are a part of this permit:

Appendix BD BACT Determination
Appendix GC General Permit Conditions

Howard L. Rhodes, Director
Division of Air Resources
Management

FACILITY DESCRIPTION

This facility consists of a municipally owned water treatment plant providing potable water to the public.

PROJECT DETAILS

This permitting action is to increase the operation of four existing diesel engine generators, and to modify the engines to comply with the emission limit specified by the BACT determination by retarding the fuel injector timing and installing turbocharger aftercoolers. Emissions units addressed by this permit are:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
009	Standby Diesel Engine Generator #1, EMD model 20-645F4B
010	Standby Diesel Engine Generator #2, EMD model 20-645F4B
011	Standby Diesel Engine Generator #3, EMD model 20-645F4B
012	Standby Diesel Engine Generator #4, EMD model 20-645F4B

All engines are General Motors Electro-Motive Diesel (EMD) model 20-645F4B generators, each with a nominal base load rating of 2.865 megawatts (MW) driven by a 4,000 bhp prime mover. Each prime mover is a 20 cylinder, 2 cycle turbocharged diesel engine.

REGULATORY CLASSIFICATION

This facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

This facility is not a major source of hazardous air pollutants (HAPs).

The emissions units included in this project are subject to regulation under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) (version dated 2/5/98).

REVIEWING AND PROCESS SCHEDULE

4/27/98	Received permit application
5/19/98	Received sufficient application fee
6/17/98	Department's request for additional information
4/5/99	Received response to request for additional information
4/5/99	Application complete
5/24/99	Distributed Notice of Intent to Issue and supporting documents
6/8/99	Notice of Intent published in Miami Daily Business Review

RELEVANT DOCUMENTS

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

- Permit application
- Department's request for additional information
- Applicant's additional information
- Department's Technical Evaluation and Preliminary Determination dated May 21, 1999
- Department's Intent to Issue dated May 24, 1999

The following specific conditions apply to all emissions units at this facility addressed by this permit.

ADMINISTRATIVE

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, phone number 850/488-0114. All documents related to reports, tests, minor modifications and notifications shall be submitted to the Department's Southeast District office at PO Box 15425, West Palm Beach, Florida, 33416-5425, and phone number 561/681-6600. Copies of all documents should be sent also to the Air Quality Management Division, Miami-Dade County Department of Environmental Resources Management, Suite 900 33 SW Second Avenue, Miami, Florida 33130-1540.

2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]

3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-110, 62-204, 62-212, 62-213, 62-296, 62-297 and the Code of Federal Regulations Title 40, Part 60, adopted by reference in the Florida Administrative Code (F.A.C.) regulations. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]

5. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Expiration: This air construction permit shall expire on July 8, 2000. The permittee, for good cause, may request that this construction/PSD permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rules 62-210.300(1), 62-4.070(4), 62-4.080, and 62-4.210, F.A.C]

   PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]

   BACT Determination: In conjunction with extension of the 18 month periods to commence or continue construction, or extension of the permit expiration date, the permittee may be required to demonstrate the adequacy of any previous determination of Best Available Control Technology (BACT) for the source. [40 CFR 52.21(j)(4)]

7. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit must be obtained prior to the beginning of construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

8. Title V Operation Permit Required: This permit authorizes construction and/or installation of the permitted emissions unit and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The owner or operator shall apply for and receive a Title V operation permit prior to expiration of this permit. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's Southeast District office at PO Box 15425, West Palm Beach, Florida, 33416-5425, and phone number 561/681-6600. Copies of all documents should be sent also to the Air Quality Management Division, Miami-Dade County Department of Environmental Resources Management, Suite 900 33 SW Second Avenue, Miami, Florida 33130-1540. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

EMISSION LIMITING STANDARDS

9. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). The test method for visible emissions shall be EPA Method 9, incorporated and adopted by reference in Chapter 62-297, F.A.C. Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C. [Rule 62-296.320(4)(b)1, F.A.C.]

10. Unconfined Emissions of Particulate Matter: [Rule 62-296.320(4)(c), F.A.C.]

    (a) No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions.

    (b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

    (c) Reasonable precautions include the following:

    - Paving and maintenance of roads, parking areas and yards.
    - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
    - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.

- Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.
- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

(d) In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

11. General Pollutant Emission Limiting Standards: [Rule 62-296.320(1)(a)&(2), F.A.C.]

(a) No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department.

(b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

[Note: An objectionable odor is defined in Rule 62-210.200(198), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.]

OPERATIONAL REQUIREMENTS

12. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by hazard of fire, wind or by other cause, the permittee shall immediately notify the Department's district office and, if applicable, appropriate local program. The notification shall include pertinent information as to the cause of the problem, and what steps are being taken to correct the problem and to prevent its recurrence, and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with Department rules. [Rule 62-4.130, F.A.C.]

13. Circumvention: No person shall circumvent any air pollution control device or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

14. Excess Emissions:

(a) Excess emissions resulting from start-up, shutdown or malfunction of any emissions units shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]

(b) 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, shutdown, or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

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

16. Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]

17. Calculation of Emission Rate: The indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

18. Test Procedures shall meet all applicable requirements of Rule 62-297.310(4), F.A.C. [Rule 62-297.310(4), F.A.C.]

19. Determination of Process Variables: [Rule 62-297.310(5), F.A.C.]

(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

20. Required Stack Sampling Facilities: Sampling facilities include sampling ports, work platforms, access to work platforms, electrical power, and sampling equipment support. All stack sampling facilities must meet any Occupational Safety and Health Administration (OSHA) Safety and Health Standards described in 29 CFR Part 1910, Subparts D and E. Sampling facilities shall also conform to the requirements of Rule 62-297.310(6), F.A.C. [Rule 62-297.310(6), F.A.C.]

21. Test Notification: The owner or operator shall notify the Department's district office and, if applicable, appropriate local program, at least 15 days prior to the date on which each formal compliance test is to begin. Notification shall include the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9., F.A.C.]

22. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

REPORTING AND RECORD KEEPING REQUIREMENTS

23. Duration of Record Keeping: Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least five years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule. [Rules 62-4.160(14)(a)&(b) and 62-213.440(1)(b)2.b., F.A.C.]

24. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.]

25. Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Department within one working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rule 62-4.130, F.A.C.]

26. Excess Emissions Report - Malfunctions: In case of excess emissions resulting from malfunctions, each owner or operator shall notify the Department or the appropriate local program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report if requested by the Department. [Rule 62-210.700(6), F.A.C.]
27. Annual Operating Report for Air Pollutant Emitting Facility: The Annual Operating Report for Air Pollutant Emitting Facility shall be completed each year and shall be submitted to the Department's Southeast District office and, if applicable, the appropriate local program by March 1 of the following year. [Rule 62-210.370(3), F.A.C.]

The following specific conditions apply to the following emissions units after construction:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
009	Standby Diesel Engine Generator #1, EMD model 20-645F4B
010	Standby Diesel Engine Generator #2, EMD model 20-645F4B
011	Standby Diesel Engine Generator #3, EMD model 20-645F4B
012	Standby Diesel Engine Generator #4, EMD model 20-645F4B

All engines are General Motors Electro-Motive Diesel (EMD) model 20-645F4B generators, each with a nominal base load rating of 2.865 megawatts (MW) driven by a 4,000 bhp prime mover. Each prime mover is a 20 cylinder, 2 cycle turbocharged diesel engine.

[Note: These emissions units are subject to regulation under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) (version dated 2/5/98), and are subject to the requirements of the state rules as indicated in this permit.]

OPERATIONAL REQUIREMENTS

1. Hours of Operation: These emissions units may operate continuously, i.e., 8,760 hours/year. [Rule 62-210.200, F.A.C., Definitions-potential to emit (PTE)]

2. Diesel Fuel: Each emissions unit shall be fired with diesel fuel with a maximum sulfur content of 0.05 percent, by weight. Fuel consumption of all emissions units combined shall not exceed 1,415,000 gallons of diesel fuel in any consecutive 12-month period. [Rule 62-210.200, F.A.C., Definitions-potential to emit (PTE)]

   [Note: At 100% engine load, each model 20-645F4B engine has a fuel consumption of approximately 197.1 gallons per hour, based on a heat input of 27.2 mmBtu/hr, and a 36-degree API diesel fuel higher heating value of 19,640 Btu/lb and density of 7.034 lb/gal.]

3. Operating Procedures: These emissions units shall be properly operated and maintained at all times in a condition to minimize emissions of air pollutants. The owner and operator shall ensure that all facility staff responsible for these emissions units are trained in their operation and maintenance in accordance with the guidelines and procedures as established by the equipment manufacturers. [Rule 62-4.070(3), F.A.C.]

EMISSION LIMITATIONS AND PERFORMANCE STANDARDS

4. Visible Emissions: These emissions units are subject to the VE requirements of specific condition 9 in Section II of this permit. [Rule 62-296.320, F.A.C.]

5. Emission Limitation, NOx: Emissions of NOx are limited as follows:

   Emissions of NOx from each of the model 20-645F4B engines shall not exceed 4.12 lb/mmBtu. [Rule 62-212.400, F.A.C. & BACT Determination for PSD-FL-249]

   [Note: This is equivalent to an emission rate of approximately 112.1 lb/hr at 100% engine load for each of the model 20-645F4B engines. Emissions of NOx are limited to 403 tons per year by the conditions of this permit.]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

6. NOx Emissions Tests: Compliance with the emission limits for NOx of this permit shall be demonstrated by an annual compliance test every federal fiscal year using EPA Method 7 or 7E, as described in 40 CFR 60, Appendix A (1997 version), adopted by reference in Rule 62-204.800, F.A.C., and adopted in Rule 62-297.401, F.A.C. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet. [Rules 62-4.070(3), 62-204.800, 62-297.340, and 62-297.401, F.A.C.]

7. Fuel Sulfur Content Tests: The owner or operator shall determine the sulfur content of each delivery of diesel fuel received for these emissions units using ASTM D 4057-88, Standard Practice for Manual Sampling of Petroleum and Petroleum Products; and one of the following test methods for sulfur in petroleum products: ASTM D 129-91, ASTM D 2622-94, or ASTM D 4294-90. These methods are adopted by Rule 62-297.440, F.A.C. The owner or operator may comply with this requirement by receiving records from the fuel supplier that indicate the sulfur content of the fuel delivered complies with the sulfur limit of specific condition 2 of this section. [Rules 62-4.070(3) and 62-297.440, F.A.C.]

REPORTING AND RECORD KEEPING REQUIREMENTS

8. Fuel Sulfur Content Records: The owner or operator shall maintain records of sulfur content of each delivery of diesel fuel received for these emissions units, made pursuant to the requirements of specific condition 7 of this section. [Rule 62-4.070(3), F.A.C.]

9. Diesel Fuel Consumption Records: The owner or operator shall make and maintain daily records of diesel fuel consumption for these emissions units at the end of each day. Within ten days of the end of each month, the owner or operator shall make records of monthly diesel fuel consumption from the daily records, and shall make records of the consecutive 12-month diesel fuel consumption to demonstrate compliance with the fuel consumption limit of specific condition 2 of this section. [Rule 62-4.070(3), F.A.C.]

10. Records of Maintenance: The owner or operator shall make and maintain records of maintenance on these emissions units sufficient to demonstrate compliance with the operating procedures requirements of specific condition 3 of this section.. [Rule 62-4.070(3), F.A.C.]

APPENDIX BD
BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department
PSD-FL-249 and 0250314-002-AC
Miami-Dade County

1. BACKGROUND

The Miami-Dade Water and Sewer Department (WASD) plans to increase the hours of operation of its four existing standby diesel engine generators at its Alexander Orr, Jr. Water Treatment Plant (WTP) in Miami-Dade County. The units were previously exempt from permitting because they were operated as emergency generators. The increase in operation will allow for power generation capacity needed to ensure uninterrupted operation of the WTP. The four diesel engine generators are all General Motors Electro-Motive Diesel (EMD) generators model 20-645F4B with a nominal base load rating of 2.865 megawatts (MW) each. Each generator is driven by a 4,000 bhp, 20 cylinder, 2 cycle turbocharged diesel engine prime mover. The engines burn transportation grade diesel fuel oil with a sulfur content of 0.05 percent or less, by weight. Fuel oil consumption will be limited to 1,415,000 gallons per year. Other existing sources of air emissions at this facility are the lime kiln and pump engines at this facility which are not part of this project.

WASD has indicated that the maximum annual air pollutant emission rates in tons per year for the four diesel generators, based on consumption of 1,415,000 gallons per year of diesel fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

POLLUTANT	PSD SIGNIFICANCE LEVELS [1]	MAXIMUM EMISSIONS	SUBJECT TO PSD REVIEW?
NOx	40	403 [2]	Yes
CO	100	20.8 [3]	No
PM/PM_{10}	25/15	5.6 [4]	No
SO_2	40	5.0 [5]	No
VOC (NMHC)	40	7.8 [6]	No

[1] Florida Administrative Code 212.400-2.
[2] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil, equivalent to operating all engines 7,180 hours per year combined, or each engine equally 1,795 hours per year.
[3] Maximum emissions based on operation of engines at 25 percent load while firing diesel fuel oil.
[4] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil. All PM is assumed to be PM_{10}.
[5] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil (0.05% sulfur by weight).
[6] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil.

Below is the BACT determination proposed by the applicant.

2. DATE OF RECEIPT OF A BACT APPLICATION

May 19, 1998
Additional information received April 5, 1999

3. BACT DETERMINATION REQUESTED BY THE APPLICANT

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	4.12 lb/mmBtu achieved by fuel injection timing retardation and turbocharger aftercooling

The Alexander Orr, Jr. Water Treatment Plant is a major source of air pollution or Title V source. Because potential emissions at this facility are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). This project will be a major modification to a major facility. (Because emissions of nitrogen oxides from this project are greater than 250 tons per year, the proposed modification, in and of itself, would also constitute a major facility with respect to PSD.) Because the project will result in a significant increase in nitrogen oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

4. REVIEWER

Joseph Kahn, P.E., prepared BACT determination

5. BACT DETERMINATION PROCEDURE

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. In addition, Rule 62-212.400(6)(a), F.A.C., states that in making the BACT determination, the Department shall give consideration to:

1. Any Environmental Protection Agency determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
2. All scientific, engineering, and technical material and other information available to the Department.
3. The emission limiting standards or BACT determination of any other state.
4. The social and economic impact of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent alternative is evaluated first. That alternative is selected as BACT unless the alternative is found to not be achievable based on technical considerations or energy, environmental or economic impacts. If this alternative is eliminated for these reasons, the next most stringent alternative is considered. This top-down approach is continued until BACT is determined. In general EPA has identified five key steps in the top-down BACT process: Identify alternative control technologies; eliminate technically infeasible options; rank remaining control technologies by control effectiveness; evaluate most effective controls; select BACT.

BACT evaluation should be performed for each emissions unit and pollutant under consideration. For this project, the emissions units under consideration are identical and the only pollutant subject to PSD review is NOx.

The Department will consider the control or reduction of "non-regulated" air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts.

The EPA has determined that a BACT determination shall not result in a selection of a control technology which would not meet any applicable emission limitation under 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants). There are no such limits applicable to this project.

In addition to the information submitted by the applicant and that information mentioned above, the Department may rely upon other available information in making its BACT determination. For this project, the Department relied upon information from the EPA Publication: Alternative Control Techniques Document: NOx Emission from Stationary Reciprocating Internal Combustion Engines, July 1993. The Department also relied upon recent BACT determinations it made for the same or similar engines at the applicant's Central District WWTP and John E. Preston WTP facilities.

6. BACT POLLUTANT ANALYSIS

For this project the PSD pollutant of concern is NOx, which is a combustion product. Although not subject to BACT, other combustion products, and products of incomplete combustion -- PM/PM_{10}, SO_2, CO and VOCs -- will be controlled through the use of very low sulfur fuel (0.05% sulfur by weight), and through proper engine maintenance and operation. These control strategies were proposed by the applicant and have been included in the draft permit. BACT for NOx is discussed below.

Nitrogen Oxides (NOx)

Oxides of nitrogen (NOx) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NOx) and by oxidation of elemental nitrogen in the combustion air (thermal NOx). The thermal NOx reaction occurs in regions of high temperature associated with the combustion of fuel. As flame temperature increases, the amount of thermal NOx increases. Fuel type affects the quantity and type of NOx generated. Pipeline natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NOx than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NOx emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NOx emissions at most small facilities are minimized by process control and good combustion practices.

In a diesel engine, injection of fuel into the cylinder starts the combustion process. Retarding the timing of fuel injection until the piston is in its downward motion increases the volume of the combustion chamber, which reduces combustion temperature and pressure, subsequently reducing the formation of NOx. However, fuel injection timing retardation generally increases black smoke and cold smoke (white smoke during start up) emissions, as well as increasing exhaust temperatures. The increase in exhaust temperatures affect turbocharger performance and may be detrimental to exhaust valve life. A small increase in fuel consumption (about two percent) and a significant increase in particulate emissions (about 25 percent) usually result from the application of fuel injection timing retardation alone to diesel engines. To counteract this problem, it has been demonstrated that the installation of a device to cool the combustion air upstream of the cylinder alleviates most of the negative side effects of IR.

In large bore diesel engines equipped with a turbocharger, the combustion air precooler consists of a heat exchanger, located downstream of the turbocharger, and is typically referred to as an aftercooler. Cooler air box temperatures reduce bulk combustion temperature, which reduces NOx formation. Because cooler air is denser, the cylinders are charged with a greater mass of air that generally helps reduce emissions of unburned hydrocarbons, carbon monoxide, and particulate matter. Manufacturer's information shows that combining a 4-degree fuel injection timing retardation with the installation of a four pass aftercooler will reduce NOx emissions by 28 percent and particulate emissions (PM_{10}) by about

7 percent with a slight decrease in fuel consumption (less than 1 percent). The fuel injection timing retardation is easily performed by alteration of the timing sequence of the engine. The installation of the turbocharger aftercooler is also relatively easily accomplished, requiring little engine downtime for completion. Thus, the retrofit is relatively easy to perform, and cost effective as shown below.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to these engines includes a 4-degree fuel injection timing retardation and a four pass aftercooler circuit. The combination of retarded fuel injection timing and lowered combustion air temperature results in less NOx formation, and is an effective emissions control technique.

7. BACT DETERMINATION BY DEP

Based on the information provided by the applicant and the informed judgement of the Department, employing the top-down BACT approach for these emissions units for NOx results in a determination that fuel injection timing retardation and turbocharger aftercooling is BACT for this project. This is described further below.

NOx Determination

The available control technologies for these emissions units for NOx, ranked in order of control effectiveness are:

1. Selective Catalytic Reduction (SCR)
2. Combined technologies of fuel injection timing retardation, turbocharger aftercooler

The following table summarizes the feasibility of using these control technologies with the EMD model 20-645F4B engines for WASD's Alexander Orr, Jr. Water Treatment Plant.

CONTROL TECHNOLOGY	EMISSION REDUCTION (%)	TECHNICALLY FEASIBLE	COST PER TON ($)	ADVERSE ENVIRON. IMPACTS	ADVERSE ENERGY IMPACTS
SCR with ammonia	85	No	1,585	Yes	Minor
Fuel injection timing retardation; turbo charger aftercooler	28	Yes	143	No	No

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has potential hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regard to costs. To ensure proper removal of NOx, ammonia concentrations must be maintained at a level that will result in ammonia being present in the exhaust. This is typically known as "ammonia slip", and is not a pollutant the Department finds desirable, particularly for the urban and suburban area surrounding this facility. Aside from the issue of ammonia slip, SCR is not technically feasible for this diesel engine because the exhaust temperatures will be below 550°F for much of the range of normal engine operation, which occurs at less than full load operation. In order for SCR technology to achieve effective reduction of NOx, the catalyst temperature must be at least 550°F. The exhaust temperature for each engine model is highest at full load, and decreases as the load is reduced. For the model 20-645F4B engines, exhaust temperature ranges from 635°F at full load to 335 °F at 25% load. Thus, the exhaust temperatures, for much of the operating range, are too low for SCR to be a feasible control technology.

In contrast, the combination of fuel injection timing retardation and turbocharger aftercooling is feasible, as described previously, and as shown above, is cost effective.

For these emissions units for NOx emissions, the Department accepts the applicant's proposed use of fuel injection timing retardation and cooling of combustion air (aftercooling) as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	4.12 lb/mmBtu achieved by fuel injection timing retardation and turbocharger aftercooling

8. COMPLIANCE

Compliance with the NOx limitations shall be in accordance with the EPA Reference Method 7 or 7E as contained in 40 CFR 60, Appendix A, with sampling via a rake probe.

9. DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Joseph Kahn, P.E.
Department of Environmental Protection
Bureau of Air Regulation
Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

CH Fancy

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date: 7/14/99

Approved By:

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources Management

Date: 7/14/99

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

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

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

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

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology (X);
(b) Determination of Prevention of Significant Deterioration (X); and
(c) Compliance with New Source Performance Standards ( ).

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

SERVE • CONSERVE

June 21, 1999

CERTIFIED: Z 427 642 184
RETURN RECEIPT

RECEIVED

JUN 28 1999

BUREAU OF
AIR REGULATION

Mr. Alvaro A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Comments and Revisions to Draft Air Construction Permit for Alexander Orr, Jr. WTP Standby Diesel Engine Generators (DEP File No. 0250314-002-AC, PSD-FL-249)

Dear Mr. Linero:

The Miami-Dade Water and Sewer Department (MDWASD) has received a copy of the above referenced draft construction permit and technical evaluation issued by the Florida Department of Environmental Protection (FDEP). Our comments are as follows:

Regarding the Technical Evaluation (TE) and Preliminary Determination:

1. In the first paragraph in Section 4. "Project Emissions", the number of generators is four.

2. The word "maximum" should be inserted before "0.05%" in the last paragraph in Section 6. "Air Pollution Control Techniques", which states "...very low sulfur diesel fuel (0.05% sulfur by weight)" for consistency within the TE and with the application.

3. The paragraph in Section 7.7 "AAQS Analysis" refers to "standby" generators, this is correct, in that the generators serve as standby power to allow for continuous operations, but is not consistent with the naming found in the rest of the document. To clarify this, our recommendation is to include the word "standby" before the word "generator" whenever referring to emissions units nos. 009, 010, 011 and 012 (General Motors Electro-Motive Diesels (EMD) model 20-645F4B).

Regarding the Draft Air Construction Permit 0250314-002-AC, PSD-FL-249:

1. Include the word "Standby" before "Generator" in the footer of the permit and in all of the emissions unit descriptions found in Section I, "Facility Information" and Section III, "Emissions Unit Specific Conditions".

2. The note at the end of Section III, Operational Requirement, condition 2 is a correct operational characteristic of a single EMD engine, but not an operational requirement. It needs be placed under the emission unit description, so it is not construed as an additional operational limitation in the Title V operating permit to be issued by FDEP Southeast District.

3. The note at the end of Section III, Emission Limitations and Performance Standards, condition 5 merely restates the limitation in other forms. The note is better suited in the technical evaluation and it needs to be removed from the final permit for clarity.

4. Revise the last sentence of condition 7 to state, "The owner or operator may comply with this requirement by receiving records from the fuel supplier that indicate the sulfur content of the fuel delivered, complies with the sulfur limit of specific condition 2 of this section."

We request that you revise the permit and technical evaluation as noted. If you have any questions regarding the requested changes, please call Mr. Richard M. O'Rourke, P.E. at (305) 669-5749 or Mr. David Lindberg, P.E. at (619) 687-0110.

Sincerely,

Jorge S. Rodriguez, P.E.
Assistant Director, Water

JSR/BMG/rmo

Attachments

cc: Joseph Kahn, FDEP/TAL
Isidore Goldman, FDEP/WPB
Manuel Delosantos, FDEP/WPB
Patrick Wong, Miami-Dade County DERM
David Lindberg, CH2M HILL

cc: File
EPA
NPS

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Jorge S. Rodriguez, P.E.
Title : Assistant Director, Water

2. Owner or Authorized Representative or Responsible Official Mailing Address :

Organization/Firm : Miami-Dade Water & Sewer Dept.
Street Address : 4200 Salzedo Street
City : Coral Gables
State : FL Zip Code : 33146-0316

3. Owner/Authorized Representative or Responsible Official Telephone Numbers :

Telephone : (305)669-7602 Fax : (305)669-5796

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*

Signature 6/22/99
Date

* Attach letter of authorization if not currently on file.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official : Name : Jorge S. Rodriguez, P.E. Title : Assistant Director, Water
2. Owner or Authorized Representative or Responsible Official Mailing Address : Organization/Firm : Miami-Dade Water & Sewer Dept. Street Address : 4200 Salzedo Street City : Coral Gables State : FL Zip Code : 33146-0316
3. Owner/Authorized Representative or Responsible Official Telephone Numbers : Telephone : (305)669-7602 Fax : (305)669-5796
4. Owner/Authorized Representative or Responsible Official Statement : *I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.* Signature 6/22/99 Date

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Owner/Authorized Representative or Responsible Official

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2. Owner or Authorized Representative or Responsible Official Mailing Address : Organization/Firm : Miami-Dade Water & Sewer Dept. Street Address : 4200 Salzedo Street City : Coral Gables State : FL Zip Code : 33146-0316
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* Attach letter of authorization if not currently on file.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Jorge S. Rodriguez, P.E.
Title : Assistant Director, Water

2. Owner or Authorized Representative or Responsible Official Mailing Address :

Organization/Firm : Miami-Dade Water & Sewer Dept.
Street Address : 4200 Salzedo Street
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Signature 6/22/99
Date

* Attach letter of authorization if not currently on file.

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

SERVE • CONSERVE

March 31, 1999

CERTIFIED: Z 427 642 158
RETURN RECEIPT

RECEIVED
APR 05 1999
BUREAU OF
AIR REGULATION

Mr. Joseph Kahn, P.E.
New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Response to FDEP Comments, FDEP File No. 0250314-002-AC (PSD-FL-249)
Alexander Orr, Jr. Water Treatment Plant

Dear Mr. Kahn:

This letter is written in response to comments we received from you in a letter dated June 17, 1998, regarding the above-referenced PSD Permit Application. A copy of the letter is included in attachment A.

Based on your comments and our discussions with you regarding this application, we request that the PSD application submitted for this facility be revised as follows:

- Replace the annual power output limitation of 40,110,000 kilowatt-hours (kW-hrs) with an annual fuel consumption limitation of 1,415,000 gallons diesel fuel; and

- Replace the power output-specific emissions limitation of 12.62 grams per kw-hr (g/kW-hr) with a heat input-based limitation of 4.12 pounds per million British Thermal Unit (lb/MMBTU);and

FDEP Form 62-210.900 signature pages and revised emissions unit information pages are provided in Attachment B. Our responses to FDEP's comments reflect these discussions and are provided below:

FDEP Comment No. 1 - FDEP requested verification that the startup and shutdown procedures provided with the application were correct; and that the frequency and duration of engine startup, shutdown, and maintenance activities, or any other times the engines are operating without producing power.

Response - Since the application is being revised from a power output-based approach to a fuel consumption-based approach, estimates of the frequency and duration of times when then engines operate without producing power should not be necessary.

FDEP Comment No. 2 - FDEP requested fuel usage information, including the heat input rate (MMBTU/hr) for each diesel engine; an explanation of why fuel limitations were not proposed; and NOx emission rate calculations in terms of lb/MMBTU for comparison to RACT limitations stated in Chapter 62-296.570(4), FAC.

Response - Fuel usage information was provided in Attachment 5 of Appendix A (Air Permit Application Form Supplemental Information) of the application. The heat-input rate is approximately 27 MMBTU/hr (API 36 diesel fuel with a higher heating value of 19,620 BTU/lb). No method is proposed to determine compliance with this rate, since it represents the maximum capacity of the engine (potential emissions).

The proposed fuel consumption limitation of 1,415,000 gallons diesel fuel corresponds to annual NOx emissions of 403 tons, which is equal to the level of emissions previously proposed. Emissions calculations and information in support of this request are provided in Attachment C. Daily and 365-day rolling total fuel consumption will be recorded from meters located between the fuel storage tank and the engine service tanks to monitor compliance with the annual limit. Emissions calculations indicate that the control technology proposed as BACT will comply with the Florida NOx RACT standard for diesel engines of 4.75 lb NOx/MMBTU.

FDEP Comment No. 3 - FDEP requested clarification of the NOx emission factor used for the 20F4B engines; the number of tests used to develop the emission factor; explanation of the inclusion of a safety factor; and NOx emission factors and emission rates if the engines were controlled by SCR.

Response - As stated above, we are requesting that the emissions limitation for the 20F4B engines be revised from a power output-based approach (emissions in terms of g/kW-hr) to a heat input-based approach (emissions in terms of lb/MMBTU). The initially requested emissions limit of 9.08 g/kW-hr is no longer relevant. Calculations provided show that no "safety factor" has been included in the determination of the heat input-based emissions limit of 4.12 lb/MMBTU (see Attachment C).

Maximum heat input-specific emissions, calculated from brake-specific fuel consumption (BSFC) rates and manufacturers test data, occur at full (100%) load operating conditions. According to information provided by EMD, uncontrolled NOx emissions from the 20F4B engine are 5.72 lb/MMBTU. This estimate is based on emissions testing performed by EMD (not on less accurate EPA emission factors). According to NOx control efficiency information provided by Engine Systems, Inc (ESI), NOx emissions reductions of 28% can be achieved through retarded fuel injection timing and aftercoolers. Therefore, controlled emissions of NOx from the 20F4B engines would be 4.12 lb/MMBTU. NOx emissions reductions of 20% to 40% are commonly accepted as achievable by retarded fuel injection timing, and some additional reduction can be achieved by cooling turbocharged combustion air (aftercoolers).

NOx emissions reductions of over 85% are commonly accepted as achievable using SCR, and the catalyst manufacturer (Peerless, Inc) has confirmed this level of efficiency. For full load operation, NOx emission rates with SCR would be 0.85 lb/MMBTU.

FDEP Comment No. 4 - FDEP noted an inconsistency in the number of 20F4B generator engines, as stated in Section 3.1.1, and the number stated in Table 3-1. FDEP also requested calculations supporting the proposed annual emission rates for comparison to PSD significant emission rates.

Response - The text in section 3.1.1 incorrectly stated that there are three 20F4B generator sets at the plant. There are actually four 20F4B generators at the plant. This was a grammatical error that had no effect on the emissions calculations presented in Table 3-1, which were based on total power output (see Attachment C).

FDEP Comment No. 5 - FDEP requested the origin of the NOx control efficiency for proposed BACT, and the effect of variable loads on this efficiency.

Response - ESI (the engine manufacturer's local representative) estimated that retarded injection timing plus an aftercooler would result in a NOx reduction of 28%. With the exception of SCR, no information is available to the applicant for any of the NOx emission control technologies evaluated regarding effectiveness as a function of load. For SCR, the treatment system becomes ineffective when exhaust temperatures drop below 550 F, which is common for reduced engine loads that typically occur at this facility.

FDEP Comment No. 6 - FDEP inquired if other NOx emission control technologies had been considered, such as alternative fuels, duel fuel firing, or engine retrofit kits. A summary of any information regarding these technologies was requested.

Response - In addition to proposed BACT, which consists of retarded injection timing plus installation of turbocharger aftercoolers, and SCR, several other NOx reduction alternatives were considered. These NOx control technology alternatives are provided in Attachment D. Proposed BACT is Alternative #2. Proposed BACT is a more effective means of NOx reduction than Alternative #1. Alternative #3 is similar to proposed BACT, except that additional cooling is assumed. A detailed cost effectiveness analysis was not performed for Alternatives #4 and #5 because the cost of these technologies approached the value of the engines.

FDEP Comment No. 7 - FDEP requested clarification of whether or not the engine exhaust stacks would be able to comply with the requirements of Chapter 62-297.310(6) regarding sampling facilities, if not, FDEP requested clarification of how testing would be conducted to show compliance with the NOx emissions limit.

Response - The 20F4B engines will not be able to comply with Chapter 62-297.310(6) (a) and (e) because there is insufficient stack length available between obstructions for a permanent sampling system and sampling ports. We propose to collect NOx samples using a temporary sampling system in accordance with Chapter 62-297-310(6) (b) through a rake probe, which composites sample volume from 3 locations across the stack diameter. Since all sampling equipment and personnel will be working at ground level, work platform and access requirements in Chapter 62-297.310(6) (d) and (e) do not apply. The facility is in compliance with electrical power requirements in Chapter 62-297.310(6)(f).

FDEP Comment No. 8 - FDEP requested past actual and future potential emissions of criteria pollutants from the engine-driven pumps, including calculations. FDEP also questioned the use of a safety factor used to determine proposed emission rates for the engine-driven pumps.

Response - Actual emissions of criteria pollutants from the engine-driven pumps are reported to FDEP in Annual Operating Reports [FDEP Form 62-210.900(5), FAC], submitted to the Southeast District office annually. Calculation of emissions can be found in these reports. A summary of reported emissions (past actual), future potential emissions (as proposed), and potential emissions calculations is provided in Attachment E.

Emissions proposed in the application are based on past actual emissions. Use of site- and model-specific emissions test results is a more accurate method of estimating emissions than the use of AP-42 emission factors for the broad classification to which the engines belong. For diesel pump engine nos. 1, 3, 4, and 5, the proposed emission rate is based on the average plus one standard deviation (informally called a "safety factor") of stack test results from 1996 and 1997. The intent of the "safety factor" is to allow for variation in emissions historically observed from these engines when well maintained. For dual fuel pump engine no. 6, the proposed emission rate is based on the average plus one standard deviation of stack test results from 1996 only. Information is provided in Attachment E to support that actual emissions will not exceed future potential emissions when all 5 of the engines are properly maintained.

The MDWASD proposed under a separate application to remove pump engine nos. 1, 3, 4, and 5 in early 2000 and install new spark-ignition gas engines for pump nos. 3, 4, and 5. No engine replacements were proposed for pump engines nos.1 and 2 (currently out-of-service), and the permits for these engines will be retired. The project will result in a <u>decrease</u> in emissions of NOx. The FDEP issued Final Permit Number 0250314-003-AC to MDWASD for this project March 5, 1999.

FDEP Comment No. 9 - FDEP inquired about the operational status of pump engine number 2.

Response - Pump engine number 2 is no longer in service and has not operated since 1991. Many major engine components have been removed from pump engine no. 2 and used to keep the other identical pump engines operable (engines nos. 1, 3, and 4).

FDEP Comment No. 10 - FDEP requested physical and historic operational information regarding several portable diesel engine-driven generator sets that were observed at the site.

Response - During most of 1998, there were two 1,750- and one 1,250-kW portable generators available for use at the plant. The purpose of these portable generators had been to act as temporary replacements for the 20F4B engine-driven generators while the 20F4B engines were being repaired. The portable generators were intended for emergency use only (in case the plant lost power) and were never operated. The temporary generators were removed from the plant in December 1998 when three of the four 20F4B engines being repaired were tested and brought back on-line.

FDEP Comment No. 11 - FDEP requested a detailed map showing the location, in UTM coordinates, of all fenceline receptors used in the air quality impact analysis. FDEP also requested diskettes containing all air quality impact analysis modeling output files.

Response - A 7.5-minute series USGS map is included in Attachment F showing the location of all fine-grid modeling receptors. Since receptors close to the Alexander Orr, Jr. WTP are located too close together for the scale of the USGS map, a separate diagram showing receptor locations close to the facility is also included. UTM coordinates are displayed along the axis of both maps. The air quality modeling files are provided on the diskette enclosed with this letter.

If you have any questions regarding this, please contact Ms. Bertha Goldenberg, P.E. at (305) 669-5711 or Mr. David Lindberg, P.E. of CH2M Hill at (619) 687-0110.

Sincerely,

RC Ready

Robert Ready, P.E.
Assistant Director of Treatment Facilities

RCR/RMO/DL/ro

Attachments

c: Isidore Goldman, P.E., FDEP Southeast District
Patrick Wong, P.E., Dade County DERM
David Lindberg, P.E., CH2M HILL
EPA
NPS

ATTACHMENT A
FDEP Comments
Request for Additional Information Regarding Air Construction/Operation Permit Application
Project Number 0250314-002-AC (PSD-FL-249)
Alexander Orr, Jr. Water Treatment Plant, Dade County

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

June 17, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Robert C. Ready, P.E.
Assistant Director of Treatment Facility
Miami-Dade Water & Sewer Department
4200 Salzedo Street
Coral Gables, FL 33146-0316

Re: Request for Additional Information Regarding Air Construction/Operation Permit Application
DEP File No. 0250314-002-AC (PSD-FL-249)
Alexander Orr, Jr. Water Treatment Plant

Dear Mr. Ready:

The Department has received your application for an air construction/operation permit for four diesel engine-driven generator sets, four diesel pump engines and one dual fuel pump engine at the Alexander Orr, Jr. Water Treatment Plant. The application was received on May 19, 1998, the date the complete fee was received. In order to continue processing your application, the Department will need the additional information below. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. Please verify that the chart for the procedures for startup and shutdown in Attachment 8 is correct for this facility. We note that six units are listed in the chart, while there are four generator sets. Please indicate the times (duration) and frequency (i.e. twice per day, five days per week) of maintenance of the four diesel engine-driven generator sets, or any other time the engines are running but do not produce power.

2. Please provide fuel usage information, including the heat input rate (mmBtu/hr) for each diesel generator. Also, explain why fuel limitations are ~~not proposed.~~ Please provide emission rate calculations for NOx in units of lb/mmBtu and compare with emission limits of NOx RACT, Rule 62-296.570(4), F.A.C.

3. Please verify that the g/bhp-hr factor used for the chosen control technology at 100% load is 9.08 for NOx for the generator sources. Does the 9.08 g/bhp-hr factor include a safety factor? If so, please explain what this safety factor is. In Attachment 3, the spreadsheet of Emissions from 20F4B Standby Generators shows that the NOx emission factor at various speeds is from test data. How many tests are used to determine the emission factor? What are the manufacturer's emission factors? Provide the factors as well as emission rates for NOx for the SCR control technology option.

In Attachment 3 calculations are provided for the 20F4B standby generators for NOx that include a safety factor. What is the safety factor and why is it used? Past actual data from ARMS show:

Emissions Unit	Test Date	NOx, lb/hr
Generator Set #1	9/18/96	62.46
Generator Set #2	9/18/96	62.84
Generator Set #3	9/18/96	61.53
Generator Set #4	9/19/96	59.95

If these generator sets can attain these emission rates, provide justification for increasing potential emissions with a safety factor.

4. In section 2.3 there are four generator sets, while in section 3.1 the data is for three 20F4B generator sets. Please indicate if this data is for all four 20F4B generator sets, and if not, please provide the data for the fourth generator set. Table 3-1 provides a comparison of proposed annual emissions with PSD significant emission rates for the EMD Model 20F4B standby generators. Please provide the supporting calculations for each proposed annual emission.

5. Please provide the calculation or origin of the efficiency for NOx reduction of 28%. Is this factor applicable at all loads?

6. Have you considered other options towards reducing NOx, such as alternative fuels, duel fuel firing, or engine retrofit kits? If so, please provide a summary, or explain why none of these considerations were chosen.

7. Please indicate if the facility will be able to comply with the requirements of Rule 62-297.310(6), F.A.C., regarding safe, permanent sampling platforms. Please note that annual testing will be required, so permanent test sampling facilities will be required.

8. Please provide past actual annual emissions of CO, NOx, SO_2, PM/PM_{10} and VOC for all of the diesel engine driven pumps, including the calculations. Also, please calculate future potential emissions and show the calculations. Please provide other supporting information to demonstrate that future potential emissions will not exceed past actual emissions. In Attachment 3, the measured emissions plus the safety factor for NOx is higher than most of the data found in ARMS.

Emissions Unit	Test Date	NOx, lb/hr
Diesel Engine Driven Pump #1	9/25/97	9.31
Diesel Engine Driven Pump #3	9/25/97	7.85
Diesel Engine Driven Pump #4	10/2/97	12.71

What is the safety factor and why is it used when the diesel engine driven pumps can attain lower emission rates?

9. How has pump engine 2 been removed from service? Have the controls and fuel source been disconnected?

10. We request the following information regarding the portable diesel engine generators that were on site during our site visit of May 4th, 1998. Please provide the engine bhp, electric generating capacity and fuel usage at full load, date of arrival on site, duration of expected use, operating hours to date on site and expected total operating hours, and an emissions estimate similar to the permanent units, and any other supporting information.

11. Please provide a detailed map showing the location of all of the fenceline receptors used in the air quality impact analysis. These receptor locations should be shown in UTM coordinates since the UTM coordinate system is used in the modeling. In addition send us diskettes containing all of the air quality impact analysis modeling output files.

Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. As a result your response should be certified by a professional engineer registered in the State of Florida. A copy of your response should be sent to Isidore Goldman, DEP Southeast District and Patrick Wong, Dade County DERM.

If you should have any questions, please call Susan DeVore-Fillmore (engineer) or Cleve Holladay (meteorologist) [project engineer] at 850/921-9537 or 850/921-9530, respectively.

Sincerely,

FOR

A.A. Linero, P.E. Administrator
New Source Review Section

AAL/sdf

cc: Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. David E. Lindberg, P.E., CH2M HILL
Mr. Isidore Goldman, SED
Mr. Patrick Wong, DERM

ATTACHMENT B
Revised FDEP Form 62-210.900 Pages
Alexander Orr, Jr. Water Treatment Plant, Dade County

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Robert Ready, P.E.
Title : Director of Treatment Facilities

2. Owner or Authorized Representative or Responsible Official Mailing Address :

Organization/Firm : Miami-Dade Water &Sewer Department
Street Address : 4200 Salzedo Street
City : Coral Gables
State : FL Zip Code : 33146-0316

3. Owner/Authorized Representative or Responsible Official Telephone Numbers :

Telephone : (305)669-7668 Fax : (305)669-3753

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the ~~owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the~~ responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application. ~~whichever is applicable.~~ I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*

R C Ready 3-31-99
Signature Date

* Attach letter of authorization if not currently on file.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Robert Ready, P.E.
Title : Director of Treatment Facilities

2. Owner or Authorized Representative or Responsible Official Mailing Address :

Organization/Firm : Miami-Dade Water &Sewer Department
Street Address : 4200 Salzedo Street
City : Coral Gables
State : FL Zip Code : 33146-0316

3. Owner/Authorized Representative or Responsible Official Telephone Numbers :

Telephone : (305)669-7668 Fax : (305)669-3753

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the ~~owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the~~ responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application. ~~whichever is applicable:~~ I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*

R E Ready 3-31-99
Signature Date

* Attach letter of authorization if not currently on file.

4. Professional Engineer Statement :

I, the undersigned, hereby certify, except as particularly noted herein, that :*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [✓] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

[signature] 2/26/99 — 26 February 1999

Signature — Date

(seal)

4. Professional Engineer Statement :

I, the undersigned, hereby certify, except as particularly noted herein, that :*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [✓] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

2/26/99

Signature

(seal)

26 February 1999

Date

ATTACHMENT C
Emissions Calculations
EMD 20-645F4B Engine
Alexander Orr, Jr. Water Treatment Plant, Dade County

NOx Emissions Calculations
Alexander Orr, Jr. Water Treatment Plant

Project Emissions Summary

Source	NOx Emissions tons/yr		lb/MMBTU	Monitoring Frequency	Proposed Limitation	Units
Before Project						
20F4B Generators	0.0					
Pump Engine Nos. 1,3, & 4	15.7		2.35			
Pump Engine No. 5	12.4		2.45			
Pump Engine No. 6	94.7		1.92			
Alexander Orr Lime Kiln	28.4		0.133	monthly	n/a	
Alexander Orr, Jr. WTP	151.2	Minor Source				
PSD Threshold	250.0					
After Project						
20F4B Generators	402.4	New Major PSD Source	4.12	daily	1,415,000	gallons (0.05 wt% sulfur)
Pump Engine Nos. 1, 3, & 4	41.3		3.12			
Pump Engine No. 5	0.0	(backup for No. 6)	1.70			
Pump Engine No. 6	81.2		1.21			
Alexander Orr Lime Kiln	28.4		0.13		n/a	
	553.3	PSD Major Source				
PSD Threshold	250.0					

* lime kiln NOx emissions are assumed equal to 140 lb/mmcf, based on an AP-42, Table 1-4.2, natural gas external combustion (commercial/institutional).

EMD Model 20-645F4B
Alexander Orr, Jr. Water Treatment Plant (4)
Miami-Dade Water and Sewer Department

		36 API Fuel Consumption			NOx Emissions (uncontrolled)				NOx Emissions (controlled)[1]			
bhp	% load	lb/bhp-hr	lb/hr	MMBTU/hr	g/hr	lb/hr	lb/MMBTU	g/bhp-hr	g/hr	lb/hr	lb/MMBTU	g/bhp-hr
4398	110%	0.346	1522	29.9	78,812	173.6	5.81	17.92	56,745	125.0	4.19	12.90
4008	100%	0.346	1387	27.2	70,621	155.6	5.72	17.62	50,847	112.0	4.12	12.69
3001	75%	0.352	1056	20.7	44,445	97.9	4.72	14.81	32,000	70.5	3.40	10.66
2000	50%	0.373	746	14.6	27,140	59.8	4.08	13.57	19,541	43.0	2.94	9.77
999	25%	0.465	465	9.1	14,705	32.4	3.55	14.72	10,588	23.3	2.56	10.60

36 deg API 7.043 lb/gal
19620 BTU/lb (HHV)

1 NOx emissions reduction through combustion modifications (timing adjustment and turbocharger aftercoolers): 28%

EMD Model 20-645F4B
Fuel Use and NOx Emissions Calculations
Alexander Orr, Jr. Water Treatment Plant (4)

Engine Load	Fuel Consumption (lb/hr)	(gal/hr)	(MMBTU/hr)
110 % load (4398 bhp)	0.346 lb fuel/bhp-hr * 4398 bhp = 1,522 lb/hr	1,522 lb/hr * gal 36-deg API/7.043 lb = 216.1 gal/hr	1,522 lb/hr * 0.0196 MMBTU/lb = 29.9 MMBTU/hr
100 % load (4008 bhp)	0.346 lb fuel/bhp-hr * 4008 bhp = 1,387 lb/hr	1,387 lb/hr * gal 36-deg API/7.043 lb = 196.9 gal/hr	1,387 lb/hr * 0.0196 MMBTU/lb = 27.2 MMBTU/hr
75 % load (3001 bhp)	0.352 lb fuel/bhp-hr * 3001 bhp = 1,056 lb/hr	1,056 lb/hr * gal 36-deg API/7.043 lb = 150.0 gal/hr	1,056 lb/hr * 0.0196 MMBTU/lb = 20.7 MMBTU/hr
50 % load (2000 bhp)	0.373 lb fuel/bhp-hr * 2000 bhp = 746 lb/hr	746 lb/hr * gal 36-deg API/7.043 lb = 105.9 gal/hr	746 lb/hr * 0.0196 MMBTU/lb = 14.6 MMBTU/hr
25 % load (999 bhp)	0.465 lb fuel/bhp-hr * 999 bhp = 465 lb/hr	465 lb/hr * gal 36-deg API/7.043 lb = 66.0 gal/hr	465 lb/hr * 0.0196 MMBTU/lb = 9.1 MMBTU/hr

Engine Load	NOx Emissions - Uncontrolled (lb/MMBTU)	NOx Emissions - Controlled (lb/MMBTU)
110 % load (4398 bhp)	17.92 g/bhp-hr * 4398 bhp * lb/454g * hr/29.9 MMBTU = 5.81 lb/MMBTU	12.90 g/bhp-hr * 4398 bhp * lb/454g * hr/29.9 MMBTU = 4.1
100 % load (4008 bhp)	17.62 g/bhp-hr * 4008 bhp * lb/454g * hr/27.2 MMBTU = 5.72 lb/MMBTU	12.69 g/bhp-hr * 4008 bhp * lb/454g * hr/27.2 MMBTU = 4.1
75 % load (3001 bhp)	14.81 g/bhp-hr * 3001 bhp * lb/454g * hr/20.7 MMBTU = 4.72 lb/MMBTU	10.66 g/bhp-hr * 3001 bhp * lb/454g * hr/20.7 MMBTU = 3.4
50 % load (2000 bhp)	13.57 g/bhp-hr * 2000 bhp * lb/454g * hr/14.6 MMBTU = 4.08 lb/MMBTU	9.77 g/bhp-hr * 2000 bhp * lb/454g * hr/14.6 MMBTU = 2.94
25 % load (999 bhp)	14.72 g/bhp-hr * 999 bhp * lb/454g * hr/9.1 MMBTU = 3.55 lb/MMBTU	10.60 g/bhp-hr * 999 bhp * lb/454g * hr/9.1 MMBTU = 2.56 l

Engine Load	NOx Emissions Equivalent Hours of Operation
110 % load (4398 bhp)	1415000 gal/yr * 7.043 lb/gal * 0.0196 MMBTU/lb * hr/29.9 MMBTU = 6,549 hrs/yr
100 % load (4008 bhp)	1415000 gal/yr * 7.043 lb/gal * 0.0196 MMBTU/lb * hr/27.2 MMBTU = 7,186 hrs/yr
75 % load (3001 bhp)	1415000 gal/yr * 7.043 lb/gal * 0.0196 MMBTU/lb * hr/20.7 MMBTU = 9,434 hrs/yr
50 % load (2000 bhp)	1415000 gal/yr * 7.043 lb/gal * 0.0196 MMBTU/lb * hr/14.6 MMBTU = 13,359 hrs/yr
25 % load (999 bhp)	1415000 gal/yr * 7.043 lb/gal * 0.0196 MMBTU/lb * hr/9.1 MMBTU = 21,453 hrs/yr

	(tons/yr)
@ 4.12 lb/MMBTU	4.12 lb NOx/MMBTU * 0.0196 MMBTU/lb fuel * 7.043 lb/gal * 1415000 gal/yr = 402 tons NOx/yr
Annual Fuel Consumption	1,415,000 gallons

EMD Model 20-645F4B
Emissions Calculations - All Pollutants - Based on information provided by EMD
Alexander Orr, Jr. Water Treatment Plant (4)

CO		tons CO/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb CO/hr * hr/MMBTU * ton/2000 lb
100 % load (4,008 bhp)	2.47 lb CO/hr	tons CO/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 2.47 lb CO/hr * hr/27.21 MMBTU * ton/2000 lb = 8.9 tons CO/yr
75 % load (3,001 bhp)	1.98 lb CO/hr	tons CO/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 1.98 lb CO/hr * hr/20.73 MMBTU * ton/2000 lb = 9.4 tons CO/yr
50 % load (2,000 bhp)	1.41 lb CO/hr	tons CO/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 1.41 lb CO/hr * hr/14.64 MMBTU * ton/2000 lb = 9.4 tons CO/yr
25 % load (999 bhp)	1.94 lb CO/hr	tons CO/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 1.94 lb CO/hr * hr/9.11 MMBTU * ton/2000 lb = 20.8 tons CO/yr
NOx (controlled)		tons NOx/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb NOx/MMBTU * ton/2000 lb
100 % load (4,008 bhp)	4.12 lb NOx/MMBTU	tons NOx/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 4.12 lb NOx/MMBTU * ton/2000 lb = 402 tons NOx/yr
75 % load (3,001 bhp)	3.40 lb NOx/MMBTU	tons NOx/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 3.40 lb NOx/MMBTU * ton/2000 lb = 332 tons NOx/yr
50 % load (2,000 bhp)	2.94 lb NOx/MMBTU	tons NOx/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 2.94 lb NOx/MMBTU * ton/2000 lb = 287 tons NOx/yr
25 % load (999 bhp)	2.56 lb NOx/MMBTU	tons NOx/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 2.56 lb NOx/MMBTU * ton/2000 lb = 250 tons NOx/yr
SO2 (0.05 weight % fuel sulfur content)		tons SO2/yr = gal/yr * lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb
100 % load (4,008 bhp)	0.05 weight % S	tons SO2/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 5.0 tons SO2/yr
75 % load (3,001 bhp)	0.05 weight % S	tons SO2/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 5.0 tons SO2/yr
50 % load (2,000 bhp)	0.05 weight % S	tons SO2/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 5.0 tons SO2/yr
25 % load (999 bhp)	0.05 weight % S	tons SO2/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 5.0 tons SO2/yr
PM-10 (controlled)		tons PM-10/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb PM-10/MMBTU * ton/2000 lb
100 % load (4,008 bhp)	0.057 lb PM-10/MMBTU	tons PM-10/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.06 lb PM-10/MMBTU * ton/2000 lb = 5.6 tons PM-10/yr
75 % load (3,001 bhp)	0.057 lb PM-10/MMBTU	tons PM-10/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.06 lb PM-10/MMBTU * ton/2000 lb = 5.6 tons PM-10/yr
50 % load (2,000 bhp)	0.057 lb PM-10/MMBTU	tons PM-10/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.06 lb PM-10/MMBTU * ton/2000 lb = 5.6 tons PM-10/yr
25 % load (999 bhp)	0.057 lb PM-10/MMBTU	tons PM-10/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.06 lb PM-10/MMBTU * ton/2000 lb = 5.6 tons PM-10/yr
NMHC		tons NMHC/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb NMHC/MMBTU * ton/2000 lb
100 % load (4,008 bhp)	0.08 lb NMHC/MMBTU	tons NMHC/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 7.8 tons NMHC/yr
75 % load (3,001 bhp)	0.08 lb NMHC/MMBTU	tons NMHC/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 7.8 tons NMHC/yr
50 % load (2,000 bhp)	0.08 lb NMHC/MMBTU	tons NMHC/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 7.8 tons NMHC/yr
25 % load (999 bhp)	0.08 lb NMHC/MMBTU	tons NMHC/yr = 1415000 gal/yr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 7.8 tons NMHC/yr

ATTACHMENT D
Cost Estimates and NOx Control Efficiencies for Diesel Engines
Alexander Orr, Jr. Water Treatment Plant, Dade County

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT. #1

ENGINE MODEL (# OF ENGINES)	BASIC NOX EMISSIONS (*TONS)	20% NOX REDUCTION (TONS)	REVISED NOX EMISSIONS (TONS)	REVISED OPERATING HOURS	ESTIMATED COST
20E4 (11)	177.5	35.5	142		$ 56,100
20E4B (4)	88.3	17.7	70.64		$ 20,400
20F4B (8)	247.8	49.6	198.24		$ 40,800
16G4A (2)	31.3	6.3	25.04		$ 10,380
12E4B (1)	13.3	2.7	10.64		$ 3,600
TOTAL (26)	558.2	111.6	446.6	500	$ 131,280
*NOTE: BASED ON 400/YR OPERATION-FULL LOAD					

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT. #1
NOTES

ALL EMISSIONS FIGURES QUOTED ARE MINIMUM REDUCTIONS ANTICIPATED

REQUIRES

1) RETARDED INJECTOR TIMING 4 DEGREES NO MATERIAL REVISIONS

OPERATING IMPACT

1) INCREASED FUEL CONSUMPTION + 2 %

2) INCREASED PARTICULATE MATTER + 25 %

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT.#2

ENGINE MODEL (# OF ENGINES)	BASIC NOX EMISSIONS (*TONS)	28% NOX REDUCTION (TONS)	REVISED NOX EMISSIONS (TONS)	REVISED OPERATING HOURS	ESTIMATED COST
20E4 (11)	177.5	49.7	127.8		$ 176,605
20E4B (4)	88.3	24.7	63.6		$ 64,220
20F4B (8)	247.8	69.4	178.4		$ 128,440
16G4A (2)	31.3	8.8	22.5		$ 31,490
12E4B (1)	13.3	3.7	9.6		$ 15,650
TOTAL (26)	558.2	156.3	401.9	556	$ 416,405
*NOTE: BASED ON 400/YR OPERATION-FULL LOAD					

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT. 2
NOTES

ALL EMISSIONS FIGURES QUOTED ARE MINIMUM REDUCTIONS ANTICIPATED

REQUIRES

1) RETARDED INJECTOR TIMING 4 DEGREES
2) RETRO FIT OF 4-PASS AFTERCOOLERS

OPERATING IMPACT

1) REDUCED PARTICULATE MATTER 7 %

2) REDUCED FUEL CONSUMPTION .7 %

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT. #3

ENGINE MODEL (# OF ENGINES)	BASIC NOX EMISSIONS (*TONS)	36% NOX REDUCTION (TONS)	REVISED NOX EMISSIONS (TONS)	REVISED OPERATING HOURS	ESTIMATED COST
20E4 (11)	177.5	63.9	113.6		$ 423,280
20E4B (4)	88.3	31.8	56.5		$ 153,920
20F4B (8)	247.8	89.2	158.6		$ 307,840
16G4A (2)	31.3	11.3	20.0		$ 77,620
12E4B (1)	13.3	4.8	8.5		$ 38,070
TOTAL (26)	558.2	201.0	357.2	625	$ 1,000,730
*NOTE: BASED ON 400/YR OPERATION-FULL LOAD					

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSSIONS REDUCTIONS ALT. #3
NOTES

ALL EMISSIONS FIGURES QUOTED ARE MINIMUM REDUCTIONS ANTICIPATED

REQUIRES

1) RETARDED INJECTOR TIMING 4 DEGREES
2) SEPERATE AFTERCOOLING OF AFTERCOOLER CIRCUIT
   CURRENT ASSUMPTION: MKW PROVIDES/INSTALLS PIPING & PUMP
   FROM FRONT OR REAR OF ENGINE
   TO HEAT EXCHANGER. DEPARTMENT PROVIDES PIPING
   FROM HEAT EXCHANGER TO WATER SOURCE

OPERATING IMPACT

1) REDUCED FUEL CONSUMPTION 1.2 %
2) REDUCED PARTICULATE MATTER 4 %

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTION ALT. #4

ENGINE MODEL (# OF ENGINES)	BASIC NOX EMISSIONS (*TONS)	50% N0X REDUCTION (TONS)	REVISED NOX EMISSIONS (TONS)	REVISED OPERATING HOURS	ESTIMATED COST
20E4 (11)	177.5	88.75	88.75		$ 3,167,340
20E4B (4)	88.3	44.15	44.2		$ 948,560
20F4B (8)	247.8	123.9	123.9		$ 515,120
16G4A (2)	31.3	15.65	15.7		$ 298,000
12E4B (1)	13.3	6.65	6.7		$ 152,670
TOTAL (26)	558.2	279.1	279.1	800	$ 5,081,690
*NOTE: BASED ON 400/YR OPERATION-FULL LOAD					

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTION ALT. #4

ALL EMISSIONS FIGURES QUOTED ARE MINIMUM REDUCTIONS ANTICIPATED

REQUIRES

645 E ENGINES

1) ALL PREVIOUS MODIFICATIONS
2) HIGH COMPRESSION PISTON & HUB LINERS
3) CBOI INJECTORS
4) 17.9:1 TURBOCHARGERS (IF NOT SO EQUIPPED)
5) RETARDED ENGINE TIMING

645E4B ENGINES

1) ALL PREVIOUS MODIFICATIONS
2) HIGH COMPRESSION PISTON & HUB LINERS
3) CBOI INJECTORS
5) RETARDED ENGINE TIMING

645 FB ENGINES

1) ALL PREVIOUS MODIFICATIONS
2) CBOI INJECTORS
3) RETARDED ENGINE TIMING

710 ENGINES

1) SEPARATELY COOLED AFTERCOOLERS
2) EMD ENGINE EMDEC FUEL SYSTEM

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMMISSIONS REDUCTIONS ALT. #5

ENGINE MODEL (# OF ENGINES)	BASIC NOX EMISSIONS (*TONS)	70% NOX REDUCTION (TONS)	REVISED NOX EMISSIONS (TONS)	REVISED OPERATING HOURS	ESTIMATED COST
20E4 (11)	177.5	124.25	53.25		$ 4,712,895
20E4B (4)	88.3	61.8	26.5		$ 1,713,780
20F4B (8)	247.8	173.5	74.3		$ 3,585,960
16G4A (2)	31.3	15.65	15.7		
12E4B (1)	13.3	9.3	4.0		$ 360,530
TOTAL (26)	558.2	384.5	173.7	1445	$ 10,373,165
*NOTE: BASED ON 400/YR OPERATION-FULL LOAD					

MIAMI DADE WATER SEWER
ENGINE POPULATION Nox EMISSIONS REDUCTIONS ALT #5
NOTES

ALL EMISSIONS FIGURES QUOTED ARE MINIMUM REDUCTIONS ANTICIPATED

REQUIRES

1) ALL 645 SERIES ENGINES BE RETROFITTED WITH ECI DUAL FUEL CONVERSION KIT

CONVERSION KIT NOT CURRENTLY AVAILABLE FOR SERIES 710 ENGINE UNDER DEVELOPMENT WITH EMD ASSISTANCE

OPERATING IMPACT

1) MAJOR INCREASE IN TIMES BETWEEN OVERHAULS

2)LOWER FUEL COSTS: GAS VERSUS DIESEL FUEL

3) LESS FREQUENT OIL CHANGES

BEST AVAILABLE COPY

PEERLESS MFG. CO.

2819 Walnut Hill Lane • Dallas, Texas 75229 • (214) 357-6181 • FAX: (214) 351-0194

FACSIMILE MESSAGE

TO: CH2MHILL
ATTN: Mr. David Lindberg
FAX: (619) 687-0111
RE: **SCR Pricing for Diesel Gen Sets**
Your Reference: Miami - Dade County Water & Sewer
Peerless Reference: PMC-1967

DATE: June 8, 1998
PAGES: One (1)
CC: PJB/TTS/PMC-1967

Dear Mr. Lindberg,

I apologize for the delay in getting you this information. We will need more detailed design dat to "firm up" our pricing and sizing.

Below is a table that summarizes the pricing for the various SCR systems. I do not have good estimates for installation, but I assume it to be between 20-35% of contract price.

	Budget SCR Price (excluding tank)
Central District 20E4 (3)	$450K
Preston WTP 20E4 (3) 20F4B (3)	 $450K $550K
Orr WTP 20F4B (4)	$780K

The budget (±20%) price includes catalyst, reactor (external insulation by others), Ammonia Flow Control Unit (AFCU), Ammonia Injection Grid (AIG). We will adjust sizing/pricing upon more detail design/information.

The preliminary size of the bigger reactors (20F4B) is approximately 36'w x 44'h x 12'd. This dimension does not include room for future catalyst. If you have any questions or need any additional information, please call.

Best Regards,

Tim T. Shippy
Sales Engineer
SCR Systems Division
PEERLESS MFG. CO.

J:\SCR\SALES\QUOTES\1968\CH26-8.FAX

PEERLESS MFG. CO.
2819 Walnut Hill Lane • Dallas, Texas 75229 • (214) 357-6181 • FAX: (214) 351-0194

FACSIMILE MESSAGE

TO: CH2MHILL
ATTN: Mr. David Lindberg
FAX: (619) 687-0111
RE: **SCR Pricing for Diesel Gen Sets**
Your Reference: Miami - Dade County Water & Sewer
Peerless Reference: PMC-1967

DATE: September 24, 1997
PAGES: One (1)
CC: PJB/TTS/PMC-1967

Dear Mr. Lindberg,

Below is a table that summarizes the pricing for the various SCR systems. I do not have good estimates for installation, but I assume it to be between 20-35% of contract price.

	Anhydrous Ammonia Consumption @ 100% Load (lbs/hr) - Estimate	Budget SCR Price per engine (excluding tank)	Price including NH_3 Storage Tanks & inst. and vaporizer
Central District 20E4 16G4A	23 ea. 18 ea.	\$165K ea. \$150K ea.	6 Systems \$1.1M
Preston WTP 20E4 20F4B	23 ea. 48 ea.	\$165K ea. \$200K ea.	6 Systems \$1.35M
Orr WTP 20F4B	48 ea.	\$200K ea.	4 Systems \$1M

The budget (±20%) price includes catalyst, reactor (external insulation by others) with transition ducting, Ammonia Flow Control Unit (AFCU), Ammonia Injection Grid (AIG). Tanks are included in final column pricing. The tank is sized to hold about 15,000 gallons H_2O. It will feed all units. We will adjust sizing/pricing upon more detail design/information.

The preliminary size of the bigger reactors (20F4B) is approximately 9'w x 11'h x 12'd. This dimension does not include room for future catalyst. If you have any questions or need any additional information, please call.

Best Regards,

Tim T. Shippy
Sales Engineer
SCR Systems Division
PEERLESS MFG. CO.

J:\SCR\SALES\QUOTES\1988\CH2MHILL.FAX

ATTACHMENT E
Summary of Past Actual and Future Potential Emissions
Engine-Driven Pump Nos. 1, 3, 4, 5, and 6
Alexander Orr, Jr. Water Treatment Plant

Pump Engine Nos. 1 - 6
Historical NOx Emissions Test Results
Alexander Orr, Jr. Water Treatment Plant

	Engine No. 1		Engine No. 3		Engine No. 4		Engine No. 5		Engine No. 6*	
	(lb/hr)	(lb/MMBTU)	(lb/hr)	(lb/MMBTU)	(lb/hr)	(lb/MMBTU)	(lb/hr)	(lb/MMBTU)	(lb/hr)	(lb/MMBTU)
1996	8.23	2.34	6.63	1.81	10.45	2.97	na	na	17.88	1.53
1997	9.13	2.12	7.85	1.83	12.71	2.95	20.53	2.60	23.28	1.84
1998	na	2.26	na	2.36	na	2.57	na	2.29	na	1.34
Avg		2.24		2.00		2.83		2.45		1.57
Proposed 4/98[1]	11.1	3.12	11.1	3.12	11.1	3.12	20.2	3.12	18.63	1.21

1 Emissions calculations are provided on the following pages.

2 Engine Nos. 1, 3, 4, and 5 are to be removed from service in early 2000. New gas engines will be installed on Pump Nos. 3, 4, and 5, as proposed in the application submitted to FDEP on 20 October 1998.

* Emissions reported for Engine No. 6 are uncontrolled. Proposed limit of 1.21 lb/MMBTU (4/98) to be attained by installing aftercooler and retarding in.

Worthington CC Diesel Engines (3), 825 bhp; Limited to 4360 hours per year operation (aggregate)
Emissions Calculations - All Pollutants - Based on emissions tests and AP-42 emissions factors for Diesel Engines (AP-42, Table 3.4-1)
Alexander Orr, Jr. Water Treatment Plant

CO		tons CO/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb CO/MMBTU * ton/2000 lb
AP-42, Table 3.4-1	0.85 lb CO/MMBTU	tons CO/yr = 4360 hr/yr * 44 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.85 lb CO/MMBTU * ton/2000 lb = 11.2 tons CO/yr
NOx		tons NOx/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb NOx/MMBTU * ton/2000 lb
1996 & 1997 Stack Tests Results*	3.12 lb NOx/MMBTU	tons NOx/yr = 4360 hr/yr * 44 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 3.12 lb NOx/MMBTU * ton/2000 lb = 41 tons NOx/yr
SO2 (0.05 weight % fuel sulfur content)		tons SO2/yr = hr/yr* gal/hr * lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb
Mass Balance	0.05 weight % S	tons SO2/yr = 4360 hr/yr * 44 gal/hr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 0.7 tons SO2/yr
PM-10		tons PM-10/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb PM-10/MMBTU * ton/2000 lb
AP-42, Table 3.4-2	0.050 lb PM-10/MMBTU	tons PM-10/yr = 4360 hr/yr * 44 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.05 lb PM-10/MMBTU * ton/2000 lb = 0.7 tons PM-10/yr
NMHC		tons NMHC/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb NMHC/MMBTU * ton/2000 lb
AP-42, Table 3.4-1	0.08 lb NMHC/MMBTU	tons NMHC/yr = 4360 hr/yr * 44 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 1.1 tons NMHC/yr

Worthington SDR Diesel Engine, 1500 bhp (serves as backup for Engine No. 6)
Emissions Calculations - All Pollutants - Based on emissions tests and AP-42 emissions factors for Dual Fuel Engines (AP-42, Table 3.4-1)
Alexander Orr, Jr. Water Treatment Plant

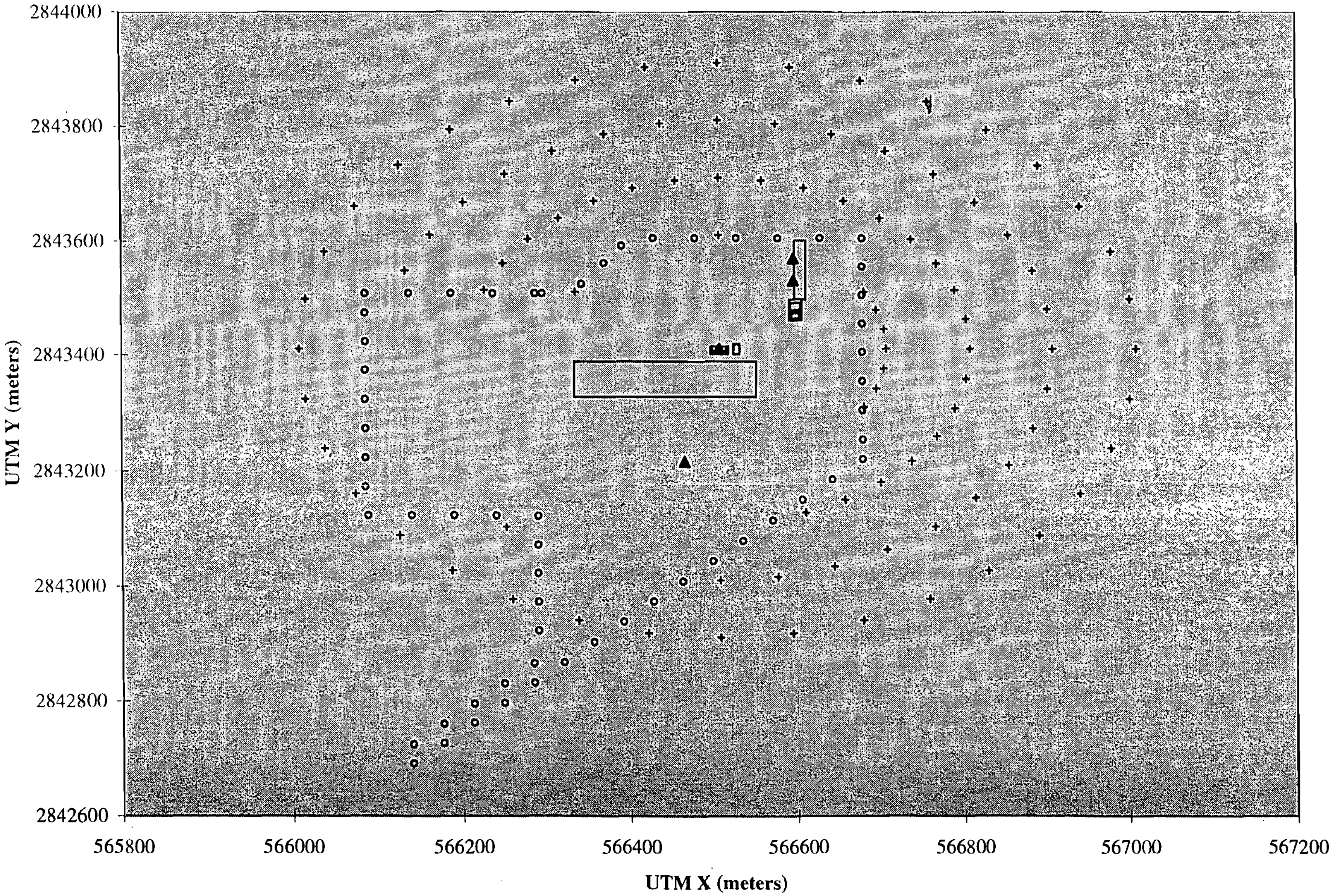
CO		tons CO/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb CO/MMBTU * ton/2000 lb
AP-42, Table 3.4-1	0.85 lb CO/MMBTU	tons CO/yr = 0 hr/yr * 80 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.85 lb CO/MMBTU * ton/2000 lb = 0.0 tons CO/yr
NOx		tons NOx/yr = hr/yr * gal/hr * lb fuel/gal * MMBTU/lb fuel* lb NOx/MMBTU * ton/2000 lb
1996 & 1997 Stack Tests Results*	3.12 lb NOx/MMBTU	tons NOx/yr = 0 hr/yr * 80 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 3.12 lb NOx/MMBTU * ton/2000 lb = 0.0 tons NOx/yr
SO2 (0.05 weight % fuel sulfur content)		tons SO2/yr = hr/yr* gal/hr * lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb
Mass Balance	0.05 weight % S	tons SO2/yr = 0 hr/yr * 80 gal/hr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 0.0 tons SO2/yr
PM-10		tons PM-10/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb PM-10/MMBTU * ton/2000 lb
AP-42, Table 3.4-2	0.050 lb PM-10/MMBTU	tons PM-10/yr = 0 hr/yr * 80 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.05 lb PM-10/MMBTU * ton/2000 lb = 0.0 tons PM-10/yr
NMHC		tons NMHC/yr = gal/yr * lb fuel/gal * MMBTU/lb fuel* lb NMHC/MMBTU * ton/2000 lb
AP-42, Table 3.4-1	0.08 lb NMHC/MMBTU	tons NMHC/yr = 0 hr/yr * 80 gal/hr * 7.043 lb fuel/gal * 0.01962 MMBTU/lb fuel * 0.08 lb NMHC/MMBTU * ton/2000 lb = 0.0 tons NMHC/yr

Enterprise Dual Fuel Engine, 2113 bhp
Emissions Calculations - All Pollutants - Based on emissions tests and AP-42 emissions factors for 4-Cycle Lean-Burn Engines (AP-42, Table 3.4-1)
Alexander Orr, Jr. Water Treatment Plant

CO		tons CO/yr = hr/yr * MMBTU/hr * lb CO/MMBTU * ton/2000 lb
AP-42, Table 3.2-1	1.16 lb CO/MMBTU	tons CO/yr = 8760 hr/yr * 15.3 MMBTU/hr * 1.16 lb CO/MMBTU * ton/2000 lb = 77.8 tons CO/yr
NOx		tons NOx/yr = hr/yr * MMBTU/hr * lb NOx/MMBTU * ton/2000 lb
1996 Stack Tests Results*	1.21 lb NOx/MMBTU	tons NOx/yr = 8760 hr/yr * 15.3 MMBTU/hr * 1.21 lb NOx/MMBTU * ton/2000 lb = 81.2 tons NOx/yr
SO2 (0.05 weight % fuel sulfur content)		tons SO2/yr = hr/yr* gal/hr * lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb
Mass Balance	0.05 weight % S	tons SO2/yr = 8760 hr/yr * 15 gal/hr * 7.043 lb fuel/gal * 0.0005 lb S/lb fuel * 2 lb SO2/lb S * ton/2000 lb = 0.5 tons SO2/yr
PM-10		tons PM-10/yr = hr/yr * MMBTU/hr * lb PM-10/MMBTU * ton/2000 lb
AP-42, Table 3.4-2	0.005 lb PM-10/MMBTU	tons PM-10/yr = 8760 hr/yr * 15.3 MMBTU/hr * 0.005 lb PM-10/MMBTU * ton/2000 lb = 0.3 tons PM-10/yr
NMHC		tons NMHC/yr = hr/yr * MMBTU/hr * lb NMHC/MMBTU * ton/2000 lb
AP-42, Table 3.4-1	0.2 lb NMHC/MMBTU	tons NMHC/yr = 8760 hr/yr * 15.3 MMBTU/hr * 0.200 lb NMHC/MMBTU * ton/2000 lb = 13.4 tons NMHC/yr

ATTACHMENT F
Alexander Orr ISCST3 Receptor Locations Superimposed onto USGS Map of South Miami Quadrangle
Close-Up Printout of ISCST3 Receptor Locations at Alexander Orr, Jr. WTP
Alexander Orr, Jr. Water Treatment Plant

Alexander Orr Jr. Water Treatment Plant
ISCST3 Dispersion Modeling Receptors



bc: B. Brant
J. Rodriguez
J. Chorlog
T. Segars
J. Zecca
J. Epaves
B. Goldenberg
R. O'Rourke

Memorandum

Florida Department of Environmental Protection

TO: Clair Fancy

FROM: Joe Kahn

DATE: May 21, 1999

SUBJECT: Miami-Dade WASD Alexander Orr, Jr. WTP
0250314-002-AC, PSD-FL-249

Attached for approval and signature is the draft PSD permit package for the standby diesel generators at Miami-Dade Water and Sewer Department's Alexander Orr, Jr. Water Treatment Plant. The applicant applied on May 19, 1998, to the Department for an air construction permit for its Alexander Orr, Jr. Water Treatment Plant Standby Diesel Engine Generators located at 6800 SW 87th Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. A BACT determination was required for NOx. NOx emissions will be controlled by the use of fuel injection timing retardation and turbocharger aftercooling.

Total emissions of pollutants shall not exceed the following annual emission rates in tons per year: NOx, 403; PM/PM_{10}, 5.6; Sulfur dioxide, 5.0; VOC, 7.8; CO, 20.8.

An air quality impact analysis was conducted. Emissions from the facility will not cause or contribute to a violation of any state or federal ambient air quality standards.

I recommend your approval and signature.

Attachments

/jk

May 24, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Jorge S. Rodriguez, P.E., Assistant Director, Water
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Coral Gables, Florida 33146-0316

Re: DEP File No. 0250314-002-AC, PSD-FL-249
Alexander Orr, Jr. WTP, Standby Diesel Engine Generators

Dear Mr. Ready:

Enclosed is one copy of the Draft air construction permit for the Alexander Orr, Jr. Water Treatment Plant Standby Diesel Engine Generators located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The Technical Evaluation and Preliminary Determination, the Department's Intent to Issue Air Construction Permit and the Public Notice of Intent to Issue Air Construction Permit are also included.

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

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please contact Joseph Kahn, P.E. at 850/921-9519 or Mr. Linero at 850/488-0114.

Sincerely,

C. H. Fancy, P.E., Chief,
Bureau of Air Regulation

CHF/jk

Enclosures

In the Matter of an
Application for Permit by:

Jorge S. Rodriguez, P.E.
Assistant Director, Water
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Coral Gables, Florida 33146-0316

DEP File No. 0250314-002-AC
PSD-FL-249
Alexander Orr, Jr. WTP, Standby Diesel Engine Generators
Miami-Dade County

INTENT TO ISSUE AIR CONSTRUCTION PERMIT

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit (copy of Draft permit attached) for the proposed project, detailed in the application specified above and the enclosed Technical Evaluation and Preliminary Determination, for the reasons stated below.

The applicant, Miami-Dade Water and Sewer Department, applied on April 13, 1998, to the Department for an air construction permit for its Alexander Orr, Jr. Water Treatment Plant Standby Diesel Engine Generators located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212. The above actions are not exempt from permitting procedures. The Department has determined that an air construction permit is required to allow the applicant to increase operation of four existing diesel engine generators.

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

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

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

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

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

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available in this proceeding.

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

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

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

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

Executed in Tallahassee, Florida.

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Intent to Issue Air Construction Permit (including the Public Notice of Intent to Issue Air Construction Permit, Technical Evaluation and Preliminary Determination, and the Draft permit) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 5-24-99 to the person(s) listed:

Jorge S. Rodriguez, P.E. *
Ms. Bertha Goldenberg, P.E.
Mr. David Lindberg, P.E., CH2M Hill
Mr. Isidore Goldman, P.E., DEP SED
Mr. Patrick Wong, P.E., DERM
Mr. Gregg Worley, EPA
Mr. John Bunyak, NPS

Clerk Stamp

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

(Clerk) 5-24-99 (Date)

Z 333 618 152

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Jorge Rodriguez	
Street & Number MD-10450	
Post Office, State, & ZIP Code Coral Gables Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 5-21-99 0250314-002-AC PSD-Fl-249	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Jorge Rodriguez, PE
Miami-Dade Water + Sewer
4700 Salzedo St.
Coral Gables, Fl
33146-0316

4a. Article Number
Z333 618 152

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
MAY 26 1999

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

8. Addressee's Address *(Only if requested and fee is paid)*

USPS

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 0250314-002-AC, PSD-FL-249

Miami-Dade Water and Sewer Department
Alexander Orr, Jr. Water Treatment Plant
Standby Diesel Engine Generators
Miami-Dade County

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Miami-Dade Water and Sewer Department, for the Alexander Orr, Jr. WTP located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. The applicant's mailing address is: 4200 Salzedo Street, Coral Gables, Florida 33146-0316. A Best Available Control Technology (BACT) determination was required for nitrogen oxides (NOx) pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). Nitrogen Oxides (NOx) emissions will be controlled by the use of fuel injection timing retardation and turbocharger aftercooling.

Total emissions of pollutants shall not exceed the following annual emission rates in tons per year: NOx, 403; PM/PM_{10}, 5.6; Sulfur dioxide, 5.0; VOC, 7.8; CO, 20.8.

An air quality impact analysis was conducted. Emissions from the facility will not cause or contribute to a violation of any state or federal ambient air quality standards. The maximum predicted PSD NO_2 increment consumed by all sources, including this project, in the nearest Class I (Everglades National Park) and Class II areas will be as follows:

Averaging Time and Class	Allowable Increment ($\mu g/m^3$)	Increment Consumed ($\mu g/m^3$)	Percent Consumed
Annual - Class I	2.5	0.86	34
Annual - Class II	25	24.1	96

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

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

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

Mediation is not available in this proceeding.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

Dept. of Environmental Protection Bureau of Air Regulation Suite 4, 111 S. Magnolia Drive Tallahassee, Florida, 32301 Telephone: 850/488-0114 Fax: 850/922-6979	Dept. of Environmental Protection Southeast District 400 North Congress Avenue West Palm Beach, Florida 33401 Telephone: 561/681-6600	Dade County Department of Environmental Resources Mgmt. Suite 900, 33 Southwest 2nd Ave. Miami, Florida 33130-1540 Telephone: 305/372-6925

The complete project file includes the application, technical evaluations, Draft permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section, or the Department's reviewing engineer for this project, Joseph Kahn, P.E., at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

TECHNICAL EVALUATION

AND

PRELIMINARY DETERMINATION

Miami-Dade Water and Sewer Department
Alexander Orr, Jr. WTP
Standby Diesel Engine Generators
Miami-Dade County

DEP File No. 0250314-002-AC
PSD-FL-249

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

May 21, 1999

1. GENERAL INFORMATION

1.1 APPLICANT NAME AND ADDRESS

Miami-Dade Water and Sewer Department
Alexander Orr, Jr. WTP
4200 Salzedo Street
Coral Gables, Florida 33146-0316

Authorized Representative: Jorge S. Rodriguez, P.E., Assistant Director, Water

1.2 REVIEWING AND PROCESS SCHEDULE

4/27/98	Received permit application
5/19/98	Received sufficient application fee
6/17/98	Department's request for additional information
4/5/99	Received response to request for additional information
4/5/99	Application complete

2. FACILITY INFORMATION

2.1 FACILITY LOCATION

This facility is located at 6800 SW 87 Avenue, Miami, Miami-Dade County. UTM coordinates are: Zone 17; 566.6 km E and 2843.5 km N.

This site is approximately17 kilometers from Everglades National Park, a Class I PSD Area.

2.2 STANDARD INDUSTRIAL CLASSIFICATION CODES (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4941	Water Supply

2.3 FACILITY CATEGORY

This facility consists of a municipally owned water treatment plant providing potable water to the public. The Miami-Dade Water and Sewer Department (WASD) is the sixth largest public utility in the United States, providing direct services to approximately 356,000 retail customers. Wholesale water service is provided to 14 municipalities and wholesale sewer service to 12 of the County's 29 municipalities. Miami-Dade County's current population of 2 million is expected to reach the 3 million mark by the year 2015.[1] The Alexander Orr, Jr. WTP supplies approximately half of the water supply of the WASD system.[2]

This facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because potential emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). (The applicant estimated emissions of NOx at this facility less than the 250 TPY major facility threshold, but there is no current limitation on operation of the diesel engine generators and, considering the potential emissions from these emissions units before the application of BACT, potential emissions from this facility exceed the major facility threshold.)

This facility is not a major source of hazardous air pollutants (HAPs).

3. PROJECT DESCRIPTION

The applicant proposes to increase operation of four existing diesel engine generators at its Alexander Orr, Jr. Water Treatment Plant in Miami. This will allow the applicant to provide power generation capacity during periods of load-sharing with the local utility, Florida Power and Light; during power failure events; or as needed under other circumstances including severe weather warnings and events of potential electric utility power losses or reductions.

This permitting action is to increase the operation of four existing diesel engine generators, and to modify the engines to comply with the emission limit specified by the BACT determination by retarding the fuel injector timing and installing turbocharger aftercoolers. Emissions units addressed by this permit are:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
009	Diesel Engine Generator #1, EMD model 20-645F4B
010	Diesel Engine Generator #2, EMD model 20-645F4B
011	Diesel Engine Generator #3, EMD model 20-645F4B
012	Diesel Engine Generator #4, EMD model 20-645F4B

All engines are General Motors Electro-Motive Diesel (EMD) model 20-645F4B generators, each with a nominal base load rating of 2.865 megawatts (MW) driven by a 4,000 bhp prime mover. Each prime mover is a 20 cylinder, 2 cycle turbocharged diesel engine.

4. PROJECT EMISSIONS

The applicant has indicated that the maximum annual air pollutant emission rates in tons per year for the six diesel generators, based on consumption of 1,415,000 gallons per year of diesel fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

POLLUTANT	PSD SIGNIFICANCE LEVELS [1]	MAXIMUM EMISSIONS	SUBJECT TO PSD REVIEW?
NOx	40	403 [2]	Yes
CO	100	20.8 [3]	No
PM/PM_{10}	25/15	5.6 [4]	No
SO_2	40	5.0 [5]	No
VOC (NMHC)	40	7.8 [6]	No

[1] Florida Administrative Code 212.400-2.
[2] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil, equivalent to operating all engines 7,180 hours per year combined, or each engine equally 1,795 hours per year.
[3] Maximum emissions based on operation of engines at 25 percent load while firing diesel fuel oil.
[4] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil.
[5] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil (0.05% sulfur by weight).
[6] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil.

The proposed project will result in "significant increases" with respect to Table 62-212.400-2, F.A.C., of emissions of nitrogen oxides (NOx). The project is therefore subject to review for the Prevention of Significant Deterioration (PSD) and a determination of Best Available Control Technology (BACT) in accordance with Rules 62-212.400, F.A.C.

The proposed project results in less-than-significant increases in carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM/PM_{10}), and volatile organic compounds (VOC).

5. RULE APPLICABILITY

The proposed project is subject to preconstruction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in an area designated, in accordance with Rule 62-204.340, F.A.C., as attainment for the criteria pollutants ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide; designated as unclassifiable for lead and PM_{10}; and also designated as a maintenance area for ozone.

The proposed project was reviewed under Rule 62-212.400(5), F.A.C., New Source Review (NSR) for Prevention of Significant Deterioration (PSD), because it will be a major modification to a major facility. (The proposed modification, in and of itself, would also constitute a new major facility subject to PSD.) This review consisted of a determination of Best Available Control Technology (BACT) and an analysis of the air quality impact of the increased emissions. (The BACT determination is documented separately.) The review also includes an analysis of the project's impacts on soils, vegetation and visibility, along with air quality impacts resulting from associated commercial, residential and industrial growth.

The BACT limits for NOx for these emissions units are more stringent that the NOx RACT limit of 4.75 lb/mmBtu specified by Rule 62-296.570(4)(b)7., F.A.C. The draft permit for this project will require compliance with the more stringent BACT limits rather than the RACT limit, and the permit will not include the RACT rule as an applicable requirement.

The emissions units in this permitting action shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules.

5.1 STATE REGULATIONS

Chapter 62-4	Permits
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.260	Prevention of Significant Deterioration Increments
Rule 62-204.360	Designation of Prevention of Significant Deterioration Areas
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.200	Definitions
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Preconstruction Review Requirements
Rule 62-212.400	Prevention of Significant Deterioration
Rule 62-212.410	Best Available Control Technology (BACT)
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-296.320	General Pollutant Emission Limiting Standards
Rule 62-297.310	General Test Requirements
Rule 62-297.401	Compliance Test Methods

6. AIR POLLUTION CONTROL TECHNIQUES

The applicant proposed to control NOx emissions by fuel injection timing retardation and installation of a turbocharger aftercooler to cool combustion air. Following is the BACT limit and the control techniques for this project.

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	4.12 lb/mmBtu achieved by fuel injection timing retardation and turbocharger aftercooling

The control techniques for NOx are discussed in more detail in the BACT Determination for this project.

The emissions of sulfur dioxide will be limited by the use of very low sulfur diesel fuel (0.05% sulfur by weight). Use of this fuel will also limit PM_{10} emissions. Emissions of VOCs, PM_{10} and CO will also be limited by proper engine maintenance and operation.

6.1 COMPLIANCE PROCEDURES

POLLUTANT	COMPLIANCE PROCEDURE
NOx	Annual test using EPA Method 7 or 7E, with rake probe

6.2 EXCESS EMISSIONS

Allowable Excess Emissions: Pursuant to Rule 62-210.700 F.A.C., excess emissions are allowable for startup, shutdown and malfunction as allowed by rule.

7. SOURCE IMPACT ANALYSIS

7.1 INTRODUCTION

The proposed project will increase NOx emissions at a level in excess of PSD significant amounts. The air quality impact analyses required by the PSD regulations for this pollutant include:

- An analysis of existing air quality;
- A significant impact analysis;
- A PSD increment analysis;
- An Ambient Air Quality Standards (AAQS) analysis; and
- An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality modeling impacts.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The significant impact, PSD increment, and AAQS analyses depend on air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed project, as described in this report and subject to the conditions of approval proposed herein, will not cause or significantly contribute to a violation of any AAQS or PSD increment. However, the following EPA-directed stack height language is included: "In approving this permit, the Department has determined that the application complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators." A discussion of the required analyses follows.

7.2 ANALYSIS OF EXISTING AIR QUALITY

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review unless otherwise exempted or satisfied. This monitoring requirement may be satisfied by using previously existing representative monitoring data, if available. An exemption to the monitoring requirement may be obtained if either of the following conditions is met: the maximum predicted air quality impact resulting from the projected emissions increase, as determined by air quality modeling, is less than a pollutant-specific de minimus concentration, or the existing ambient concentrations are less than a pollutant-specific de minimus concentration. If preconstruction ambient monitoring is exempted, determination of background concentrations for PSD significant pollutants with established AAQS may still be necessary for use in any required AAQS analysis. These concentrations may be established from the required preconstruction ambient air quality monitoring analysis or from the existing representative monitoring data. These background ambient air quality concentrations are added to pollutant impacts predicted by modeling and represent the air quality impacts of sources not included in the modeling.

Annual NO_2 impacts from the project are predicted to be 23.7 ug/m^3, which is greater than the de minimus level of 14 ug/m^3; therefore, preconstruction monitoring is required. However, previously existing representative monitoring data does exist from the Rosenstiel-Virginia Key monitor in the vicinity of the project. A background concentration was established for use in the required AAQS analysis from these data. This monitor had a measured annual average NO_2 concentration of 12 ug/m^3 in 1997.

7.3 MODELS AND METEOROLOGICAL DATA USED IN SIGNIFICANT IMPACT, PSD INCREMENT AND AAQS ANALYSES

The EPA-approved Industrial Source Complex Short-Term (ISCST3) dispersion model was used to evaluate the pollutant emissions from the proposed project and other existing major facilities. The model determines ground-level concentrations of inert gases or small particles emitted into the atmosphere by point, area, and volume sources. The model incorporates elements for plume rise, transport by the mean wind, Gaussian dispersion, and pollutant removal mechanisms such as deposition. The ISCST3 model allows for the separation of sources, building wake downwash, and various other input and output features. A series of specific model features, recommended by the EPA, are referred to as the regulatory options. The applicant used the EPA recommended regulatory options in each modeling scenario. Direction-specific downwash parameters were used for all sources for which downwash was considered. The stacks associated with this project all satisfy the good engineering practice (GEP) stack height criteria.

Meteorological data used in the ISCST3 model consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Miami, Florida (surface data) and West Palm Beach, Florida (upper air data). The 5-year period of meteorological data was from 1987 through 1991. These NWS stations were selected for use in the study because they are the closest primary weather stations to the study area and are most representative of the project site. The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling.

For this project, since only the impacts of NOx emissions are being evaluated and since the NO_2 standards and increments are based on annual averages, the highest predicted annual averages were compared with the significant impact level, the AAQS and the PSD increments.

7.4 SIGNIFICANT IMPACT ANALYSIS

Initially, the applicant conducted modeling to determine whether the proposed project's NOx emissions were predicted to have a significant impact in the vicinity of the facility or in the Class I area. The applicant placed over 1,000 receptors along the site boundary and out to 16 km from the facility, which is located in a PSD Class II area. A total of 32 receptors were placed along the northern and eastern boundaries of the Everglades National Park (ENP). ENP is a PSD Class I area which is located approximately 17 km from the project at its closest point. The tables below show the results of this modeling. The radius of significant impact is also shown in the first table below.

MAXIMUM PROJECT AIR QUALITY IMPACT FOR COMPARISON TO THE PSD CLASS II SIGNIFICANT IMPACT LEVEL IN THE VICINITY OF THE FACILITY

POLLUTANT	AVERAGING TIME	MAXIMUM PREDICTED IMPACT (ug/m^3)	SIGNIFICANT IMPACT LEVEL (ug/m^3)	SIGNIFICANT IMPACT?	RADIUS OF SIGNIFICANT IMPACT (km)
NO_2	Annual	23.7	1	YES	7

MAXIMUM PROJECT AIR QUALITY IMPACT IN THE ENP FOR COMPARISON TO THE PSD CLASS I SIGNIFICANT IMPACT LEVEL

POLLUTANT	AVERAGING TIME	MAXIMUM PREDICTED IMPACT (ug/m^3)	SIGNIFICANT IMPACT LEVEL (ug/m^3)	SIGNIFICANT IMPACT?
NO_2	Annual	0.34	0.1	YES

As shown in the tables the maximum predicted air quality impacts due to NOx emissions from the proposed project are greater than the PSD significant impact levels both in the vicinity of the facility and in the ENP. Therefore, the applicant was required to do full impact NO_2 modeling in the vicinity of the facility, within the applicable significant impact area, to determine the impacts of the project along with all other sources in the vicinity of the facility. The significant impact area is based upon the predicted radius of significant impact. Full impact modeling is modeling that considers not only the impact of the project but the impacts of the existing facility and other major sources, including background concentrations, located within the vicinity of the project to determine whether all increments or AAQS are predicted to be met.

7.5 PROCEDURE FOR PERFORMING PSD INCREMENTS AND AAQS ANALYSES

For the PSD and AAQS analyses, receptor grids normally are based on the size of the significant impact area for each pollutant. The size of the significant impact areas for the required NO_2 analyses were based on a 7 km radius of significant impact.

7.6 PSD INCREMENT ANALYSIS

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant. The results of the required PSD Class I and II increment analyses presented in the tables below show that all of the maximum predicted impacts are less than the allowable Class II increments.

PSD CLASS II INCREMENT ANALYSIS IN THE VICINITY OF THE FACILITY

POLLUTANT	AVERAGING TIME	MAXIMUM PREDICTED IMPACT (ug/m^3)	IMPACT GREATER THAN ALLOWABLE INCREMENT?	ALLOWABLE INCREMENT (ug/m^3)
NO_2	Annual	24.1	NO	25

PSD CLASS I INCREMENT ANALYSIS IN THE ENP

POLLUTANT	AVERAGING TIME	MAXIMUM PREDICTED IMPACT (ug/m^3)	IMPACT GREATER THAN ALLOWABLE INCREMENT?	ALLOWABLE INCREMENT (ug/m^3)
NO_2	Annual	0.86	NO	2.5

7.7 AAQS ANALYSIS

The results of the NO_2 AAQS analysis are summarized in the table below. As shown in this table, emissions from the proposed facility are not expected to cause or significantly contribute to a violation of any AAQS. The maximum predicted impact is located along the property fenceline 195 m north of the standby generators.

AMBIENT AIR QUALITY IMPACTS

AVERAGING TIME	MODELED SOURCES IMPACT (ug/m^3)	BACKGROUND CONC. (ug/m^3)	MAXIMUM PREDICTED IMPACT (ug/m^3)	AAQS (ug/m^3)	PREDICTED IMPACT GREATER THAN AAQS?
Annual	87.5	12	99.5	100	NO

7.8 ADDITIONAL IMPACTS ANALYSIS

7.8.1 IMPACTS ON SOILS, VEGETATION, WILDLIFE, AND VISIBILITY

The maximum ground-level concentrations predicted to occur due to NOx emissions as a result of the proposed project, including all other nearby sources, will be below the associated AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils and vegetation in the PSD Class II area. An air quality related values (AQRV) analysis was done by the applicant for the Class I area. No significant impacts on this area are expected. A visibility analysis was done by the Department for the Class I area. This analysis showed no significant impact on visibility in this area.

7.8.2 GROWTH-RELATED AIR QUALITY IMPACTS

There will be no growth associated with this project.

8. CONCLUSION

Based on the foregoing technical evaluation of the application and additional information submitted by the applicant, the Department has made a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations. The Department will issue a draft permit to the applicant that allows the applicant to modify the engines to comply with the emission limit specified by the BACT determination and increase the use of the four existing diesel engine generators.

Joseph Kahn, P.E. and Cleve Holladay (modeling)
Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
850/921-9519

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1 Provided by WASD at www.metro-dade.com/wasd/customer.htm.

2 Telephone conversation with Richard O'Rourke of WASD, January 1999.

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PERMITTEE

Miami-Dade Water and Sewer Department
Alexander Orr, Jr. WTP
4200 Salzedo Street
Coral Gables, Florida 33146-0316

Permit No.	0250314-002-AC, PSD-FL-249
Project	Diesel Engine Generators
SIC No.	4941
Expires:	^DRAFT

Authorized Representative:

Jorge S. Rodriguez, P.E., Assistant Director, Water

PROJECT AND LOCATION

This permit authorizes Miami-Dade Water and Sewer Department to increase the operation of four existing diesel engine generators, and to modify the engines to comply with the emission limit specified by the BACT determination by retarding the fuel injector timing and installing turbocharger aftercoolers.

This facility is located at 6800 SW 87 Avenue, Miami, Miami-Dade County. UTM coordinates are: Zone 17; 566.6 km E and 2843.5 km N.

STATEMENT OF BASIS

This construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297. The above named permittee is authorized to construct/modify the emissions units in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department of Environmental Protection (Department).

APPENDICES

The attached appendices are a part of this permit:

Appendix BD BACT Determination
Appendix GC General Permit Conditions

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Howard L. Rhodes, Director
Division of Air Resources
Management

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FACILITY DESCRIPTION

This facility consists of a municipally owned water treatment plant providing potable water to the public.

PROJECT DETAILS

This permitting action is to increase the operation of four existing diesel engine generators, and to modify the engines to comply with the emission limit specified by the BACT determination by retarding the fuel injector timing and installing turbocharger aftercoolers. Emissions units addressed by this permit are:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
009	Diesel Engine Generator #1, EMD model 20-645F4B
010	Diesel Engine Generator #2, EMD model 20-645F4B
011	Diesel Engine Generator #3, EMD model 20-645F4B
012	Diesel Engine Generator #4, EMD model 20-645F4B

All engines are General Motors Electro-Motive Diesel (EMD) model 20-645F4B generators, each with a nominal base load rating of 2.865 megawatts (MW) driven by a 4,000 bhp prime mover. Each prime mover is a 20 cylinder, 2 cycle turbocharged diesel engine.

REGULATORY CLASSIFICATION

This facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for at least one criteria pollutant, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

This facility is not a major source of hazardous air pollutants (HAPs).

The emissions units included in this project are subject to regulation under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) (version dated 2/5/98).

REVIEWING AND PROCESS SCHEDULE

4/27/98	Received permit application
5/19/98	Received sufficient application fee
6/17/98	Department's request for additional information
4/5/99	Received response to request for additional information
4/5/99	Application complete
5/^/99	Distributed Notice of Intent to Issue and supporting documents
^	Notice of Intent published in ^

RELEVANT DOCUMENTS

The documents listed below are the basis of the permit. They are specifically related to this permitting action. These documents are on file with the Department.

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- Permit application
- Department's request for additional information
- Applicant's additional information
- Department's Technical Evaluation and Preliminary Determination dated May 21, 1999
- Department's Intent to Issue dated ^

The following specific conditions apply to all emissions units at this facility addressed by this permit.

ADMINISTRATIVE

1. Regulating Agencies: All documents related to applications for permits to construct, operate or modify an emissions unit should be submitted to the Bureau of Air Regulation (BAR), Florida Department of Environmental Protection at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, phone number 850/488-0114. All documents related to reports, tests, minor modifications and notifications shall be submitted to the Department's Southeast District office at PO Box 15425, West Palm Beach, Florida, 33416-5425, and phone number 561/681-6600. Copies of all documents should be sent also to the Air Quality Management Division, Miami-Dade County Department of Environmental Resources Management, Suite 900 33 SW Second Avenue, Miami, Florida 33130-1540.
2. General Conditions: The owner and operator is subject to and shall operate under the attached General Permit Conditions G.1 through G.15 listed in Appendix GC of this permit. General Permit Conditions are binding and enforceable pursuant to Chapter 403 of the Florida Statutes. [Rule 62-4.160, F.A.C.]
3. Terminology: The terms used in this permit have specific meanings as defined in the corresponding chapters of the Florida Administrative Code.
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of Chapter 403, F.S. and Florida Administrative Code Chapters 62-4, 62-110, 62-204, 62-212, 62-213, 62-296, 62-297 and the Code of Federal Regulations Title 40, Part 60, adopted by reference in the Florida Administrative Code (F.A.C.) regulations. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the facility owner or operator from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
5. New or Additional Conditions: Pursuant to Rule 62-4.080, F.A.C., for good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
6. Expiration: This air construction permit shall expire on ^DRAFT. The permittee, for good cause, may request that this construction/PSD permit be extended. Such a request shall be submitted to the Department's Bureau of Air Regulation prior to 60 days before the expiration of the permit. [Rules 62-210.300(1), 62-4.070(4), 62-4.080, and 62-4.210, F.A.C]

   PSD Expiration: Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, or if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The Department may extend the 18-month period upon a satisfactory showing that an extension is justified. [40 CFR 52.21(r)(2)]

   BACT Determination: In conjunction with extension of the 18 month periods to commence or continue construction, or extension of the permit expiration date, the permittee may be required to demonstrate

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the adequacy of any previous determination of Best Available Control Technology (BACT) for the source. [40 CFR 52.21(j)(4)]

7. Modifications: No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit must be obtained prior to the beginning of construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

8. Title V Operation Permit Required: This permit authorizes construction and/or installation of the permitted emissions unit and initial operation to determine compliance with Department rules. A Title V operation permit is required for regular operation of the permitted emissions unit. The owner or operator shall apply for and receive a Title V operation permit prior to expiration of this permit. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the Department's Southeast District office at PO Box 15425, West Palm Beach, Florida, 33416-5425, and phone number 561/681-6600. Copies of all documents should be sent also to the Air Quality Management Division, Miami-Dade County Department of Environmental Resources Management, Suite 900 33 SW Second Avenue, Miami, Florida 33130-1540. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

EMISSION LIMITING STANDARDS

9. General Visible Emissions Standard: Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer, or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density if which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20% opacity). The test method for visible emissions shall be EPA Method 9, incorporated and adopted by reference in Chapter 62-297, F.A.C. Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C. [Rule 62-296.320(4)(b)1, F.A.C.]

10. Unconfined Emissions of Particulate Matter: [Rule 62-296.320(4)(c), F.A.C.]

    (a) No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions.

    (b) Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter.

    (c) Reasonable precautions include the following:

    - Paving and maintenance of roads, parking areas and yards.
    - Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
    - Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities.

- Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent reentrainment, and from buildings or work areas to prevent particulate from becoming airborne.
- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter.
- Confining abrasive blasting where possible.
- Enclosure or covering of conveyor systems.

(d) In determining what constitutes reasonable precautions for a particular source, the Department shall consider the cost of the control technique or work practice, the environmental impacts of the technique or practice, and the degree of reduction of emissions expected from a particular technique or practice.

11. General Pollutant Emission Limiting Standards: [Rule 62-296.320(1)(a)&(2), F.A.C.]

(a) No person shall not store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department.

(b) No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor.

[Note: An objectionable odor is defined in Rule 62-210.200(198), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.]

OPERATIONAL REQUIREMENTS

12. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by hazard of fire, wind or by other cause, the permittee shall immediately notify the Department's district office and, if applicable, appropriate local program. The notification shall include pertinent information as to the cause of the problem, and what steps are being taken to correct the problem and to prevent its recurrence, and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with Department rules. [Rule 62-4.130, F.A.C.]

13. Circumvention: No person shall circumvent any air pollution control device or allow the emission of air pollutants without the applicable air pollution control device operating properly. [Rule 62-210.650, F.A.C.]

14. Excess Emissions:

(a) Excess emissions resulting from start-up, shutdown or malfunction of any emissions units shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized, but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]

(b) 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, shutdown, or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

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

16. Operating Rate During Testing: Unless otherwise stated in the applicable emission limiting standard rule, testing of emissions shall be conducted with the emissions unit operation at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]

17. Calculation of Emission Rate: The indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]

18. Test Procedures shall meet all applicable requirements of Rule 62-297.310(4), F.A.C. [Rule 62-297.310(4), F.A.C.]

19. Determination of Process Variables: [Rule 62-297.310(5), F.A.C.]

(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.

(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.

20. Required Stack Sampling Facilities: Sampling facilities include sampling ports, work platforms, access to work platforms, electrical power, and sampling equipment support. All stack sampling facilities must meet any Occupational Safety and Health Administration (OSHA) Safety and Health Standards described in 29 CFR Part 1910, Subparts D and E. Sampling facilities shall also conform to the requirements of Rule 62-297.310(6), F.A.C. [Rule 62-297.310(6), F.A.C.]

21. Test Notification: The owner or operator shall notify the Department's district office and, if applicable, appropriate local program, at least 15 days prior to the date on which each formal compliance test is to begin. Notification shall include the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9., F.A.C.]

22. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the facility to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions units and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

REPORTING AND RECORD KEEPING REQUIREMENTS

23. Duration of Record Keeping: Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least five years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule. [Rules 62-4.160(14)(a)&(b) and 62-213.440(1)(b)2.b., F.A.C.]

24. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.]

25. Excess Emissions Report: If excess emissions occur, the owner or operator shall notify the Department within one working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident. Pursuant to the New Source Performance Standards, excess emissions shall also be reported in accordance with 40 CFR 60.7, Subpart A. [Rule 62-4.130, F.A.C.]

26. Excess Emissions Report - Malfunctions: In case of excess emissions resulting from malfunctions, each owner or operator shall notify the Department or the appropriate local program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report if requested by the Department. [Rule 62-210.700(6), F.A.C.]

27. Annual Operating Report for Air Pollutant Emitting Facility: The Annual Operating Report for Air Pollutant Emitting Facility shall be completed each year and shall be submitted to the Department's Southeast District office and, if applicable, the appropriate local program by March 1 of the following year. [Rule 62-210.370(3), F.A.C.]

The following specific conditions apply to the following emissions units after construction:

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
009	Diesel Engine Generator #1, EMD model 20-645F4B
010	Diesel Engine Generator #2, EMD model 20-645F4B
011	Diesel Engine Generator #3, EMD model 20-645F4B
012	Diesel Engine Generator #4, EMD model 20-645F4B

All engines are General Motors Electro-Motive Diesel (EMD) model 20-645F4B generators, each with a nominal base load rating of 2.865 megawatts (MW) driven by a 4,000 bhp prime mover. Each prime mover is a 20 cylinder, 2 cycle turbocharged diesel engine.

[Note: These emissions units are subject to regulation under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) (version dated 2/5/98), and are subject to the requirements of the state rules as indicated in this permit.]

OPERATIONAL REQUIREMENTS

1. Hours of Operation: These emissions units may operate continuously, i.e., 8,760 hours/year. [Rule 62-210.200, F.A.C., Definitions-potential to emit (PTE)]

2. Diesel Fuel: Each emissions unit shall be fired with diesel fuel with a maximum sulfur content of 0.05 percent, by weight. Fuel consumption of all emissions units combined shall not exceed 1,415,000 gallons of diesel fuel in any consecutive 12-month period. [Rule 62-210.200, F.A.C., Definitions-potential to emit (PTE)]

   [Note: At 100% engine load, each model 20-645F4B engine has a fuel consumption of approximately 197.1 gallons per hour, based on a heat input of 27.2 mmBtu/hr, and a 36-degree API diesel fuel higher heating value of 19,640 Btu/lb and density of 7.034 lb/gal.]

3. Operating Procedures: These emissions units shall be properly operated and maintained at all times in a condition to minimize emissions of air pollutants. The owner and operator shall ensure that all facility staff responsible for these emissions units are trained in their operation and maintenance in accordance with the guidelines and procedures as established by the equipment manufacturers. [Rule 62-4.070(3), F.A.C.]

EMISSION LIMITATIONS AND PERFORMANCE STANDARDS

4. Visible Emissions: These emissions units are subject to the VE requirements of specific condition 9 in Section II of this permit. [Rule 62-296.320, F.A.C.]

5. Emission Limitation, NOx: Emissions of NOx are limited as follows:

   Emissions of NOx from each of the model 20-645F4B engines shall not exceed 4.12 lb/mmBtu. [Rule 62-212.400, F.A.C. & BACT Determination for PSD-FL-249]

   [Note: This is equivalent to an emission rate of approximately 112.1 lb/hr at 100% engine load for each of the model 20-645F4B engines. Emissions of NOx are limited to 403 tons per year by the conditions of this permit.]

COMPLIANCE MONITORING AND TESTING REQUIREMENTS

6. NOx Emissions Tests: Compliance with the emission limits for NOx of this permit shall be demonstrated by an annual compliance test using EPA Method 7 or 7E, as described in 40 CFR 60, Appendix A (1997 version), adopted by reference in Rule 62-204.800, F.A.C., and adopted in Rule 62-297.401, F.A.C. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet. [Rules 62-4.070(3), 62-204.800, 62-297.340, and 62-297.401, F.A.C.]

7. Fuel Sulfur Content Tests: The owner or operator shall determine the sulfur content of each delivery of diesel fuel received for these emissions units using ASTM D 4057-88, Standard Practice for Manual Sampling of Petroleum and Petroleum Products; and one of the following test methods for sulfur in petroleum products: ASTM D 129-91, ASTM D 2622-94, or ASTM D 4294-90. These methods are adopted by Rule 62-297.440, F.A.C. The owner or operator may comply with this requirement by receiving such records provided by the diesel fuel supplier. [Rules 62-4.070(3) and 62-297.440, F.A.C.]

REPORTING AND RECORD KEEPING REQUIREMENTS

8. Fuel Sulfur Content Records: The owner or operator shall maintain records of sulfur content of each delivery of diesel fuel received for these emissions units, made pursuant to the requirements of specific condition 7 of this section. [Rule 62-4.070(3), F.A.C.]

9. Diesel Fuel Consumption Records: The owner or operator shall make and maintain daily records of diesel fuel consumption for these emissions units at the end of each day. Within ten days of the end of each month, the owner or operator shall make records of monthly diesel fuel consumption from the daily records, and shall make records of the consecutive 12-month diesel fuel consumption to demonstrate compliance with the fuel consumption limit of specific condition 2 of this section. [Rule 62-4.070(3), F.A.C.]

10. Records of Maintenance: The owner or operator shall make and maintain records of maintenance on these emissions units sufficient to demonstrate compliance with the operating procedures requirements of specific condition 3 of this section. [Rule 62-4.070(3), F.A.C.]

Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department
PSD-FL-249 and 0250314-002-AC
Miami-Dade County

1. BACKGROUND

The Miami-Dade Water and Sewer Department (WASD) plans to increase the hours of operation of its four existing standby diesel engine generators at its Alexander Orr, Jr. Water Treatment Plant (WTP) in Miami-Dade County. The units were previously exempt from permitting because they were operated as emergency generators. The increase in operation will allow for power generation capacity needed to ensure uninterrupted operation of the WTP. The four diesel engine generators are all General Motors Electro-Motive Diesel (EMD) generators model 20-645F4B with a nominal base load rating of 2.865 megawatts (MW) each. Each generator is driven by a 4,000 bhp, 20 cylinder, 2 cycle turbocharged diesel engine prime mover. The engines burn transportation grade diesel fuel oil with a sulfur content of 0.05 percent or less, by weight. Fuel oil consumption will be limited to 1,415,000 gallons per year. Other existing sources of air emissions at this facility are the lime kiln and pump engines at this facility which are not part of this project.

WASD has indicated that the maximum annual air pollutant emission rates in tons per year for the four diesel generators, based on consumption of 1,415,000 gallons per year of diesel fuel oil, with a maximum sulfur content of 0.05 percent, by weight, will be:

POLLUTANT	PSD SIGNIFICANCE LEVELS [1]	MAXIMUM EMISSIONS	SUBJECT TO PSD REVIEW?
NOx	40	403 [2]	Yes
CO	100	20.8 [3]	No
PM/PM_{10}	25/15	5.6 [4]	No
SO_2	40	5.0 [5]	No
VOC (NMHC)	40	7.8 [6]	No

[1] Florida Administrative Code 212.400-2.
[2] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil, equivalent to operating all engines 7,180 hours per year combined, or each engine equally 1,795 hours per year.
[3] Maximum emissions based on operation of engines at 25 percent load while firing diesel fuel oil.
[4] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil. All PM is assumed to be PM_{10}.
[5] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil (0.05% sulfur by weight).
[6] Maximum emissions based on operation of engines consuming all permitted diesel fuel oil.

Below is the BACT determination proposed by the applicant.

2. DATE OF RECEIPT OF A BACT APPLICATION

May 19, 1998
Additional information received April 5, 1999

3. BACT DETERMINATION REQUESTED BY THE APPLICANT

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	4.12 lb/mmBtu achieved by fuel injection timing retardation and turbocharger aftercooling

The Alexander Orr, Jr. Water Treatment Plant is a major source of air pollution or Title V source. Because potential emissions at this facility are greater than 250 TPY for at least one criteria pollutant, the facility is also a major facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD). This project will be a major modification to a major facility. (Because emissions of nitrogen oxides from this project are greater than 250 tons per year, the proposed modification, in and of itself, would also constitute a major facility with respect to PSD.) Because the project will result in a significant increase in nitrogen oxides emissions per Table 62-212.400-2, F.A.C., "Regulated Air Pollutants - Significant Emissions Rates," a BACT determination is required pursuant to Rule 62-212.410, F.A.C.

4. REVIEWER

Joseph Kahn, P.E., prepared BACT determination

5. BACT DETERMINATION PROCEDURE

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. In addition, Rule 62-212.400(6)(a), F.A.C., states that in making the BACT determination, the Department shall give consideration to:

1. Any Environmental Protection Agency determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
2. All scientific, engineering, and technical material and other information available to the Department.
3. The emission limiting standards or BACT determination of any other state.
4. The social and economic impact of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent alternative is evaluated first. That alternative is selected as BACT unless the alternative is found to not be achievable based on technical considerations or energy, environmental or economic impacts. If this alternative is eliminated for these reasons, the next most stringent alternative is considered. This top-down approach is continued until BACT is determined. In general EPA has identified five key steps in the top-down BACT process: Identify alternative control technologies; eliminate technically infeasible options; rank remaining control technologies by control effectiveness; evaluate most effective controls; select BACT.

BACT evaluation should be performed for each emissions unit and pollutant under consideration. For this project, the emissions units under consideration are identical and the only pollutant subject to PSD review is NOx.

The Department will consider the control or reduction of "non-regulated" air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts.

The EPA has determined that a BACT determination shall not result in a selection of a control technology which would not meet any applicable emission limitation under 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants). There are no such limits applicable to this project.

In addition to the information submitted by the applicant and that information mentioned above, the Department may rely upon other available information in making its BACT determination. For this project, the Department relied upon information from the EPA Publication: Alternative Control Techniques Document: NOx Emission from Stationary Reciprocating Internal Combustion Engines, July 1993. The Department also relied upon recent BACT determinations it made for the same or similar engines at the applicant's Central District WWTP and John E. Preston WTP facilities.

6. BACT POLLUTANT ANALYSIS

For this project the PSD pollutant of concern is NOx, which is a combustion product. Although not subject to BACT, other combustion products, and products of incomplete combustion -- PM/PM_{10}, SO_2, CO and VOCs -- will be controlled through the use of very low sulfur fuel (0.05% sulfur by weight), and through proper engine maintenance and operation. These control strategies were proposed by the applicant and have been included in the draft permit. BACT for NOx is discussed below.

Nitrogen Oxides (NOx)

Oxides of nitrogen (NOx) are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel (fuel NOx) and by oxidation of elemental nitrogen in the combustion air (thermal NOx). The thermal NOx reaction occurs in regions of high temperature associated with the combustion of fuel. As flame temperature increases, the amount of thermal NOx increases. Fuel type affects the quantity and type of NOx generated. Pipeline natural gas is low in nitrogen. However it causes higher flame temperatures and generates more thermal NOx than oil or coal, which have higher fuel nitrogen content, but exhibit lower flame temperatures.

NOx emissions represent a significant portion of the total emissions generated by this project, and must be minimized using BACT. A review of EPA BACT/LAER Clearinghouse (BACT Clearinghouse) information indicates that NOx emissions at most small facilities are minimized by process control and good combustion practices.

In a diesel engine, injection of fuel into the cylinder starts the combustion process. Retarding the timing of fuel injection until the piston is in its downward motion increases the volume of the combustion chamber, which reduces combustion temperature and pressure, subsequently reducing the formation of NOx. However, fuel injection timing retardation generally increases black smoke and cold smoke (white smoke during start up) emissions, as well as increasing exhaust temperatures. The increase in exhaust temperatures affect turbocharger performance and may be detrimental to exhaust valve life. A small increase in fuel consumption (about two percent) and a significant increase in particulate emissions (about 25 percent) usually result from the application of fuel injection timing retardation alone to diesel engines. To counteract this problem, it has been demonstrated that the installation of a device to cool the combustion air upstream of the cylinder alleviates most of the negative side effects of IR.

In large bore diesel engines equipped with a turbocharger, the combustion air precooler consists of a heat exchanger, located downstream of the turbocharger, and is typically referred to as an aftercooler. Cooler air box temperatures reduce bulk combustion temperature, which reduces NOx formation. Because cooler air is denser, the cylinders are charged with a greater mass of air that generally helps reduce emissions of unburned hydrocarbons, carbon monoxide, and particulate matter. Manufacturer's information shows that combining a 4-degree fuel injection timing retardation with the installation of a four pass aftercooler will reduce NOx emissions by 28 percent and particulate emissions (PM_{10}) by about

7 percent with a slight decrease in fuel consumption (less than 1 percent). The fuel injection timing retardation is easily performed by alteration of the timing sequence of the engine. The installation of the turbocharger aftercooler is also relatively easily accomplished, requiring little engine downtime for completion. Thus, the retrofit is relatively easy to perform, and cost effective as shown below.

The applicant has proposed modification of the combustion process through a combination of fuel injection timing retardation and cooling of combustion air resulting in exhaust temperature reduction. The design specific to these engines includes a 4-degree fuel injection timing retardation and a four pass aftercooler circuit. The combination of retarded fuel injection timing and lowered combustion air temperature results in less NOx formation, and is an effective emissions control technique.

7. BACT DETERMINATION BY DEP

Based on the information provided by the applicant and the informed judgement of the Department, employing the top-down BACT approach for these emissions units for NOx results in a determination that fuel injection timing retardation and turbocharger aftercooling is BACT for this project. This is described further below.

NOx Determination

The available control technologies for these emissions units for NOx, ranked in order of control effectiveness are:

1. Selective Catalytic Reduction (SCR)
2. Combined technologies of fuel injection timing retardation, turbocharger aftercooler

The following table summarizes the feasibility of using these control technologies with the EMD model 20-645F4B engines for WASD's Alexander Orr, Jr. Water Treatment Plant.

CONTROL TECHNOLOGY	EMISSION REDUCTION (%)	TECHNICALLY FEASIBLE	COST PER TON ($)	ADVERSE ENVIRON. IMPACTS	ADVERSE ENERGY IMPACTS
SCR with ammonia	85	No	1,585	Yes	Minor
Fuel injection timing retardation; turbo charger aftercooler	28	Yes	143	No	No

SCR is more widely used in Japan and Germany than it is in the United States and the technology is being improved such that the hazards and costs have been reduced. It remains, however, a costly technology for small applications and has potential hazards associated with the use and storage of ammonia. SCR is not generally used with diesel engines of this size. The BACT/LAER database lists only a single facility which uses SCR on diesel engines. SCR was selected in that instance because a local ordinance mandated strict limits on emissions without regard to costs. To ensure proper removal of NOx, ammonia concentrations must be maintained at a level that will result in ammonia being present in the exhaust. This is typically known as "ammonia slip", and is not a pollutant the Department finds desirable, particularly for the urban and suburban area surrounding this facility. Aside from the issue of ammonia slip, SCR is not technically feasible for this diesel engine because the exhaust temperatures will be below 550°F for much of the range of normal engine operation, which occurs at less than full load operation. In order for SCR technology to achieve effective reduction of NOx, the catalyst temperature must be at least 550°F. The exhaust temperature for each engine model is highest at full load, and decreases as the load is reduced. For the model 20-645F4B engines, exhaust temperature ranges from 635°F at full load to 335 °F at 25% load. Thus, the exhaust temperatures, for much of the operating range, are too low for SCR to be a feasible control technology.

In contrast, the combination of fuel injection timing retardation and turbocharger aftercooling is feasible, as described previously, and as shown above, is cost effective.

For these emissions units for NOx emissions, the Department accepts the applicant's proposed use of fuel injection timing retardation and cooling of combustion air (aftercooling) as BACT for this project.

The BACT emission levels established by the Department are as follows:

POLLUTANT	EMISSION LIMIT
Nitrogen Oxides	4.12 lb/mmBtu achieved by fuel injection timing retardation and turbocharger aftercooling

8. COMPLIANCE

Compliance with the NOx limitations shall be in accordance with the EPA Reference Method 7 or 7E as contained in 40 CFR 60, Appendix A, with sampling via a rake probe.

9. DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Joseph Kahn, P.E.
Department of Environmental Protection
Bureau of Air Regulation
Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended By:

DRAFT

C. H. Fancy, P.E., Chief
Bureau of Air Regulation

Date:

Approved By:

DRAFT

Howard L. Rhodes, Director
Division of Air Resources Management

Date:

G.1 The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

G.2 This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings or exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

G.3 As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

G.4 This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

G.5 This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

G.6 The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

G.7 The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

(a) Have access to and copy and records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

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

G.8 If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

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

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

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

G.10 The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

G.11 This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

G.12 This permit or a copy thereof shall be kept at the work site of the permitted activity.

G.13 This permit also constitutes:

(a) Determination of Best Available Control Technology (X);
(b) Determination of Prevention of Significant Deterioration (X); and
(c) Compliance with New Source Performance Standards ( ).

G.14 The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
(c) Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements;
2. The person responsible for performing the sampling or measurements;
3. The dates analyses were performed;
4. The person responsible for performing the analyses;
5. The analytical techniques or methods used; and
6. The results of such analyses.

G.15 When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

P.E. Certification Statement

Miami-Dade Water and Sewer Department **DEP File No.:** 0250314-002-AC
Alexander Orr, Jr. WTP, Standby Diesel Engine Generators PSD-FL-249

Project: Air Construction Permit (PSD Permit)

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

This review was conducted by myself.

(Seal)

Joseph Kahn, P.E.

5/4/99
Date

Permitting Authority:
Florida Department of Environmental Protection
Division of Air Resources Management
Bureau of Air Regulation
New Source Review Section
Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Telephone: 850/488-0114
Fax: 850/922-6979

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

SERVE • CONSERVE

June 14, 1999

CERTIFIED: Z 427 642 183
RETURN RECEIPT

Mr. Joseph Kahn, P.E.
Air Quality Engineer
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: Draft Air Construction Permit for Alexander Orr, Jr. Water Treatment Plant
Florida DEP File No. 0250314-002-AC, PSD-FL-249

Dear Mr. Kahn:

Attached, please find a certified proof of publication of the "Public Notice of the Notice of Intent to Issue Air Construction Permit" for the standby diesel engine generators at the Alexander Orr, Jr. Water Treatment Plant, as required by Section 403.815, Florida Statutes.

Should you have any questions, please call me at (305) 669-5749.

Sincerely,

Richard M. O'Rourke, P.E.
Environmental Permits

ro
Attachment

c: Isidore Goldman, FDEP Southeast District
Patrick Wong, Miami-Dade County DERM
David Lindberg, CH2M Hill, San Diego
cc: File

L9930dep.wpd

MIAMI DAILY BUSINESS REVIEW

Published Daily except Saturday, Sunday and Legal Holidays
Miami, Dade County, Florida.

STATE OF FLORIDA
COUNTY OF DADE:

Before the undersigned authority personally appeared Octelma V. Ferbeyre, who on oath says that she is the Supervisor, Legal Notices of the Miami Daily Business Review f/k/a Miami Review, a daily (except Saturday, Sunday and Legal Holidays) newspaper, published at Miami in Dade County, Florida; that the attached copy of advertisement, being a Legal Advertisement of Notice in the matter of

MIAMI-DADE WATER AND SEWER DEPARTMENT PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT DEP FILE NO. 0250314-002-AC, PSD-FL-249

in the ....XXXXX.......... Court,

was published in said newspaper in the issues of

Jun 8, 1999

Affiant further says that the said Miami Daily Business Review is a newspaper published at Miami in said Dade County, Florida, and that the said newspaper has heretofore been continuously published in said Dade County, Florida, each day (except Saturday, Sunday and Legal Holidays) and has been entered as second class mail matter at the post office in Miami in said Dade County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

[signature]

Sworn to and subscribed before me this

8 ....day of June .... A.D. 19 99

[signature]

(SEAL)

Octelma V. Ferbeyre personally known to me.

OFFICIAL NOTARY SEAL
CHERYL H MARMER
COMMISSION NUMBER
CC545384
MY COMMISSION EXPIRES
APR. 12,2000

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION DEP FILE NO. 0250314-002-AC, PSD-FL-249 MIAMI-DADE WATER AND SEWER DEPARTMENT ALEXANDER ORR, JR. WATER TREATMENT PLANT STANDBY DIESEL ENGINE GENERATORS MIAMI-DADE COUNTY

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Miami-Dade Water and Sewer Department, for the Alexander Orr, Jr. WTP located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. The applicant's mailing address is: 4200 Salzedo Street, Coral Gables, Florida 33146-0316. A Best Available Control Technology (BACT) determination was required for nitrogen oxides (NOx) pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). Nitrogen Oxides (NOx) emissions will be controlled by the use of fuel injection timing retardation and turbocharger aftercooling.

Total emissions of pollutants shall not exceed the following annual emission rates in tons per year: NOx, 403; PM/PM_{10}, 5.6; Sulfur dioxide, 5.0; VOC, 7.8; CO, 20.8.

An air quality impact analysis was conducted. Emissions from the facility will not cause or contribute to a violation of any state or federal ambient air quality standards. The maximum predicted PSD NO_2 increment consumed by all sources, including this project, in the nearest Class I (Everglades National Park) and Class II areas will be as follows:

Averaging Time and Class	Allowable Increment (μg/m³)	Increment Consumed (μg/m³)	Percent Consumed
Annual - Class I	2.5	0.86	34
Annual - Class II	25	24.1	96

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

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

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

Mediation is not available in this proceeding.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

Dept. of Environmental Protection
Bureau of Air Regulation
Suite 4, 111 S. Magnolia Drive
Tallahassee, Florida, 32301
Telephone: 850/488-0114
Fax: 850/922-6979

Dept. of Environmental Protection
Southeast District Office
400 North Congress Avenue
West Palm Beach, Florida 33401
Telephone: 561/681-6600

Dade County Department of
Environmental Resources Mgmt.
Suite 900, 33 Southwest 2nd. Ave.
Miami, Florida 33130-1540
Telephone: 305/372-6925

The complete project file includes the application, technical evaluations, Draft permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section, or the Department's reviewing engineer of this project, Joseph Kahn, P.E., at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

BEST AVAILABLE COPY

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

SERVE • CONSERVE

September 23, 1998

Mr. Thomas Tittle
Southeast District Office
Florida Department of Environmental Protection
Southeast District
P.O. Box 15425
West Palm Beach, FL 33416

Subj: Compliance Testing of Stand by Generators at Alexander Orr, Jr. Water Treatment Plant
Facility I.D.: 50WPB0250314

Dear Mr. Tittle:

This letter is to advise you that due to failures in three of the four plant standby generators, the compliance testing requirements of F.A.C. Rule 62-297.310(7)(a)4 will not be met for all of the units. The compliance testing of the operable standby generator is being deferred as well, as it can not meet the testing requirements of F.A.C. Rule 62-297.310(2)(b). The compliance testing of all other plant emissions units has been completed. We will keep you advised and schedule compliance testing in approximately 2 to 4 weeks after each unit is repaired and operational.

Should you have any questions regarding this, please contact me at (305) 669-7668 or Mr. Richard M. O'Rourke at (305) 669-5749.

Sincerely,

RC Ready

Robert C. Ready, P.E.
Assistant Director,
Treatment Facilities

RCR/RMO/ro

cc: Al Linero, FDEP/TAL

L9865dep.wpd

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

June 17, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Robert C. Ready, P.E.
Assistant Director of Treatment Facility
Miami-Dade Water & Sewer Department
4200 Salzedo Street
Coral Gables, FL 33146-0316

Re: Request for Additional Information Regarding Air Construction/Operation Permit Application
DEP File No. 0250314-002-AC (PSD-FL-249)
Alexander Orr, Jr. Water Treatment Plant

Dear Mr. Ready:

The Department has received your application for an air construction/operation permit for four diesel engine-driven generator sets, four diesel pump engines and one dual fuel pump engine at the Alexander Orr, Jr. Water Treatment Plant. The application was received on May 19, 1998, the date the complete fee was received. In order to continue processing your application, the Department will need the additional information below. Should your response to any of the below items require new calculations, please submit the new calculations, assumptions, reference material and appropriate revised pages of the application form.

1. Please verify that the chart for the procedures for startup and shutdown in Attachment 8 is correct for this facility. We note that six units are listed in the chart, while there are four generator sets. Please indicate the times (duration) and frequency (i.e. twice per day, five days per week) of maintenance of the four diesel engine-driven generator sets, or any other time the engines are running but do not produce power.

2. Please provide fuel usage information, including the heat input rate (mmBtu/hr) for each diesel generator. Also, explain why fuel limitations are not proposed. Please provide emission rate calculations for NOx in units of lb/mmBtu and compare with emission limits of NOx RACT, Rule 62-296.570(4), F.A.C.

3. Please verify that the g/bhp-hr factor used for the chosen control technology at 100% load is 9.08 for NOx for the generator sources. Does the 9.08 g/bhp-hr factor include a safety factor? If so, please explain what this safety factor is. In Attachment 3, the spreadsheet of Emissions from 20F4B Standby Generators shows that the NOx emission factor at various speeds is from test data. How many tests are used to determine the emission factor? What are the manufacturer's emission factors? Provide the factors as well as emission rates for NOx for the SCR control technology option.

In Attachment 3 calculations are provided for the 20F4B standby generators for NOx that include a safety factor. What is the safety factor and why is it used? Past actual data from ARMS show:

Emissions Unit	Test Date	NOx, lb/hr
Generator Set #1	9/18/96	62.46
Generator Set #2	9/18/96	62.84
Generator Set #3	9/18/96	61.53
Generator Set #4	9/19/96	59.95

If these generator sets can attain these emission rates, provide justification for increasing potential emissions with a safety factor.

4. In section 2.3 there are four generator sets, while in section 3.1 the data is for three 20F4B generator sets. Please indicate if this data is for all four 20F4B generator sets, and if not, please provide the data for the fourth generator set. Table 3-1 provides a comparison of proposed annual emissions with PSD significant emission rates for the EMD Model 20F4B standby generators. Please provide the supporting calculations for each proposed annual emission.

5. Please provide the calculation or origin of the efficiency for NOx reduction of 28%. Is this factor applicable at all loads?

6. Have you considered other options towards reducing NOx, such as alternative fuels, duel fuel firing, or engine retrofit kits? If so, please provide a summary, or explain why none of these considerations were chosen.

7. Please indicate if the facility will be able to comply with the requirements of Rule 62-297.310(6), F.A.C., regarding safe, permanent sampling platforms. Please note that annual testing will be required, so permanent test sampling facilities will be required.

8. Please provide past actual annual emissions of CO, NOx, SO_2, PM/PM_{10} and VOC for all of the diesel engine driven pumps, including the calculations. Also, please calculate future potential emissions and show the calculations. Please provide other supporting information to demonstrate that future potential emissions will not exceed past actual emissions. In Attachment 3, the measured emissions plus the safety factor for NOx is higher than most of the data found in ARMS.

Emissions Unit	Test Date	NOx, lb/hr
Diesel Engine Driven Pump #1	9/25/97	9.31
Diesel Engine Driven Pump #3	9/25/97	7.85
Diesel Engine Driven Pump #4	10/2/97	12.71

What is the safety factor and why is it used when the diesel engine driven pumps can attain lower emission rates?

9. How has pump engine 2 been removed from service? Have the controls and fuel source been disconnected?

10. We request the following information regarding the portable diesel engine generators that were on site during our site visit of May 4th, 1998. Please provide the engine bhp, electric generating capacity and fuel usage at full load, date of arrival on site, duration of expected use, operating hours to date on site and expected total operating hours, and an emissions estimate similar to the permanent units, and any other supporting information.

11. Please provide a detailed map showing the location of all of the fenceline receptors used in the air quality impact analysis. These receptor locations should be shown in UTM coordinates since the UTM coordinate system is used in the modeling. In addition send us diskettes containing all of the air quality impact analysis modeling output files.

Rule 62-4.050(3), F.A.C. requires that all applications for a Department permit must be certified by a professional engineer registered in the State of Florida. This requirement also applies to responses to Department requests for additional information of an engineering nature. As a result your response should be certified by a professional engineer registered in the State of Florida. A copy of your response should be sent to Isidore Goldman, DEP Southeast District and Patrick Wong, Dade County DERM.

If you should have any questions, please call Susan DeVore-Fillmore (engineer) or Cleve Holladay (meteorologist) [project engineer] at 850/921-9537 or 850/921-9530, respectively.

Sincerely,

FOR

A.A. Linero, P.E. Administrator
New Source Review Section

AAL/sdf

cc: Mr. Brian Beals, EPA
Mr. John Bunyak, NPS
Mr. David E. Lindberg, P.E., CH2M HILL
Mr. Isidore Goldman, SED
Mr. Patrick Wong, DERM

P 265 659 374

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert C Reader	
Street & Number Miami Dade	
Post Office, State, & ZIP Code Alexander Orr	
Postage Coral Gables Fl	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 6-17-98 0250314-002-AC PSD-F1-249	

PS Form **3800**, April 1995

Is your **RETURN ADDRESS** completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert C. Reader
Miami Dade Water + Sewer
4200 Salzedo St.
Coral Gables, Fl
33146-0316

4a. Article Number
P 265 659 374

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
6/19/98

5. Received By: *(Print Name)*
L. BANFIELD

6. Signature: *(Addressee or Agent)*
X L. Banfield

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

SERVE • CONSERVE

May 11, 1998

CERTIFIED: Z 427 642 055
RETURN RECEIPT

RECEIVED
MAY 1 ୨ 1998
BUREAU OF
AIR REGULATION

Mr. Alvaro Linero, P.E.
Administrator
New Source Review Section
Florida Department of Environmental Protection
Tallahassee, FL 32399-2400

RE: Application for Air Construction Permit for Four Diesel Engine-Driven Generator Sets at the Alexander Orr, Jr. Water Treatment Plant, Miami, Florida - Facility ID No. 0250314

Dear Mr. Linero:

Enclosed, please find a check in amount of $5,500 for the balance of the $13,000 application fee to obtain a Prevention of Significant Deterioration (PSD) air construction permit for four standby generators and pump engines at the above-referenced facility.

If you have any questions regarding the application, please contact Bertha Goldenberg at (305) 669-5711 or David Lindberg of CH2M Hill at (619) 687-0110.

Sincerely,

R C Ready

Robert Ready, P.E.
Assistant Director of Treatment Facilities

c: Isidore Goldman, FDEP Southeast District
Patrick Wong, Dade County DERM
David Lindberg, CH2M HILL

L9831dep.wpd

BEST AVAILABLE COPY

MIAMI-DADE WATER AND SEWER DEPARTMENT
POOLED CASH FUND
P.O. BOX 330316 • MIAMI, FLORIDA 33233-0316

CHECK NO.
137432

DATE	PAYEE NAME			
05/06/98	STATE OF FLORIDA DEPARTMENT OF			
INVOICE DATE	**INVOICE NUMBER**	**AMOUNT**	**PURCHASE ORDER NUMBER**	**DESCRIPTION**
04-23-98	DP002067	5,500.00	DP002067	
	TOTAL	5,500.00		

The attached check represents the amount due you from
Dade County as shown on file in the Clerk's Office. For additional information Contact (305) 665-7471

METRO·DADE

METROPOLITAN DADE COUNTY, FLORIDA 137432

63-643
670

MIAMI-DADE WATER AND SEWER DEPARTMENT-POOLED CASH FUND

VOID AFTER SIX MONTHS
FIRST UNION NATIONAL BANK
OF FLORIDA
MIAMI, FLORIDA 33131

Date	Control Number	Amount of Check
05/06/98	00137432	$5,500.00

PAY EXACTLY ****5,500 DOLLARS AND 00 CENTS

METROPOLITAN DADE COUNTY

MAYOR

CLERK

To The Order Of

STATE OF FLORIDA DEPARTMENT O
ENVIRONMENTAL PROTECTION
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 32399

[redacted]

SERVE • CONSERVE

MIAMI-DADE WATER AND SEWER DEPARTMENT
4200 Salzedo Street, Coral Gables, Florida 33146 • Tel: 305-669-3700 • Fax: 669-3788

April 22, 1998

CERTIFIED: Z 427 642 049
RETURN RECEIPT

RECEIVED
APR 27 1998
BUREAU OF
AIR REGULATION

Mr. Alvaro Linero, P.E.
Administrator
New Source Review Section
Florida Department of Environmental Protection
Tallahassee, FL 32399-2400

RE: Application for Air Construction Permit for Four Diesel Engine-Driven Generator Sets at the Alexander Orr, Jr. Water Treatment Plant, Miami, Florida - Facility ID No. 0250314

Dear Mr. Linero: 0250314-002-AC PSD-FI-249

Enclosed, please find our application to obtain a Prevention of Significant Deterioration (PSD) air construction permit for four standby generators at the above-referenced facility and includes:

1) One (1) signed and sealed filled application.
2) Three (3) additional signed and sealed signature pages.
3) Four (4) diskettes copies of the application in the Electronic Submission of Application System (ELSA) format.
4) Check in amount of $7,500 for the application.

We request that all permits be reviewed and issued simultaneously, as minimal construction is necessary and the entire process can be accomplished through a single public notice. If you have any questions about this application, please contact Bertha Goldenberg at (305) 669-5711 or David Lindberg of CH2M Hill at (619) 687-0110.

Sincerely,

R. Ready

Robert Ready, P.E.
Assistant Director of Treatment Facilities

RECEIVED
APR 27 1998
BUREAU OF
AIR REGULATION

c: Isidore Goldman, FDEP Southeast District
Patrick Wong, Dade County DERM
David Lindberg, CH2M HILL

EPA
NPS
C Holladay
S. Devore-Fillmore

L9826dep.wpd

MIAMI-DADE WATER AND SEWER DEPARTMENT
POOLED CASH FUND
P.O. BOX 330316 • MIAMI, FLORIDA 33233-0316

CHECK NO.
132918

DATE	PAYEE NAME
02/11/98	STATE OF FLORIDA DEPARTMENT OF

INVOICE DATE	INVOICE NUMBER	AMOUNT	PURCHASE ORDER NUMBER	DESCRIPTION
08-15-97	DP000439	7,500.00	DP000439	
	TOTAL	7,500.00		

The attached check represents the amount due you from
Dade County as shown on file in the Clerk's Office. For additional information Contact (305) 665-7471

METRO·DADE

METROPOLITAN DADE COUNTY, FLORIDA 132918 $\frac{63\text{-}643}{670}$

MIAMI-DADE WATER AND SEWER DEPARTMENT-POOLED CASH FUND

VOID AFTER SIX MONTHS
FIRST UNION NATIONAL BANK
OF FLORIDA
MIAMI, FLORIDA 33131

Date	Control Number	Amount of Check
02/11/98	00132918	$7,500.00

PAY
EXACTLY ****7,500 DOLLARS AND 00 CENTS

To
The
Order
Of

STATE OF FLORIDA DEPARTMENT O
ENVIRONMENTAL PROTECTION
2600 BLAIR STONE ROAD
TALLAHASSEE, FL 32399

METROPOLITAN DADE COUNTY
MAYOR
CLERK

[redacted]

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :

Name : Robert C. Ready, P.E.
Title : Asst. Director, Treatment Facilities

2. Owner or Authorized Representative or Responsible Official Mailing Address :

Organization/Firm : Miami-Dade Water & Sewer Dept.
Street Address : 4200 Salzedo Street
City : Coral Gables
State : FL Zip Code : 33146-0316

3. Owner/Authorized Representative or Responsible Official Telephone Numbers :

Telephone : (305)669-7668 Fax : (305)669-3753

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*

RC Ready 4-22-98
Signature Date

* Attach letter of authorization if not currently on file.

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official : Name : Robert C. Ready, P.E. Title : Asst. Director, Treatment Facilities
2. Owner or Authorized Representative or Responsible Official Mailing Address : Organization/Firm : Miami-Dade Water & Sewer Dept. Street Address : 4200 Salzedo Street City : Coral Gables State : FL Zip Code : 33146-0316
3. Owner/Authorized Representative or Responsible Official Telephone Numbers : Telephone : (305)669-7668 Fax : (305)669-3753
4. Owner/Authorized Representative or Responsible Official Statement : *I, the undersigned, am the owner or authorized representative* of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.* RC Ready 4-22-98 Signature Date

* Attach letter of authorization if not currently on file.

Application for Air Construction Permit for

Four Diesel Engine-Driven Generator Sets at the Alexander Orr, Jr. Water Treatment Plant Miami, Florida

Prepared for:

Miami-Dade Water and Sewer Department

Prepared by:

CH2MHILL

March 1998

Contents

Contents, continued

RECEIVED
APR 27 1998
BUREAU OF
AIR REGULATION

Tables

Figures

Acronyms

acfm	actual cubic feet per minute
ARC	ambient reference concentration
BACT	Best Achievable Control Technology
bhp	brake horsepower
BSFC	brake-specific fuel consumption
CAA	Clean Air Act
CO	carbon monoxide
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FLM	Federal Land Manager
FP&L	Florida Power & Light Company
fps	feet per second
ft	foot (or feet)
g/s	gram(s) per second
GEP	good engineering practice
H_2SO_4	sulfuric acid
HAP	hazardous air pollutant
HC	hydrocarbon
HNO_3	nitric acid
IC	internal combustion
IR	fuel injection timing retard
ISC	Industrial Source Complex
°K	degrees Kelvin
km	kilometer(s)
kW	kilowatt
kW-hr	kilowatt-hour
$\mu g/m^3$	microgram(s) per cubic meter
m	meter
m^3/s	cubic meter(s) per second
MIA	Miami International Airport
m/s	meter(s) per second

Acronyms, continued

NAAQS	National Ambient Air Quality Standards
NH_3	ammonia
NO	nitric oxide
NO_x	nitrogen oxides
NO_2	nitrogen dioxide
PAH	polycyclic aromatic hydrocarbon
PEC	purchased equipment cost
PM-10	particulate matter less than 10 microns in diameter
ppm	parts per million
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
rpm	revolutions per minute
SCR	selective catalytic reduction
SO_2	sulfur dioxide
SO_3	sulfite
SO_4	sulfate
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WASD	Water and Sewer Department (Miami-Dade)
WTP	water treatment plant

Rec'd: April 27, 1998
Airs ID #: 0250314-002-AC
PSD-FL-249

SECTION 1

Introduction

The Miami-Dade Water and Sewer Department (WASD) is proposing to increase operation of four existing (and previously exempt) standby electricity generators at its Alexander Orr, Jr. Water Treatment Plant (WTP) in Miami, Florida. Increased operation of the generator sets will be used to provide power generation capacity as needed to ensure uninterrupted Miami water supply and pressure to the South Dade County population.

Each generator set is rated to produce 2,865 kilowatts (kW) of electric power at continuous full load operating conditions, and is driven by a 4,000-brake horsepower (bhp) diesel engine prime mover. The generators are capable of operating at load conditions ranging from 20 percent to 110 percent (peaking duty for durations not to exceed 2 hours). The engines burn transportation grade diesel fuel, which has a sulfur content of 0.05 weight percent.

The air quality impact analysis conducted in support of this application has determined that maximum allowable operation of the standby generators will not cause an adverse impact on air quality at any location, or pose any threats to ambient air quality standards, Prevention of Significant Deterioration (PSD) increments, or visibility in the Everglades National Park Class I area. This permit application was prepared with the assistance of the consulting firm, CH2M HILL. Questions regarding CH2M HILL's participation can be addressed to the individuals listed below at Miami-Dade WASD in Coral Gables, Florida, or CH2M HILL in San Diego, California:

Ms. Bertha M. Goldenberg, P.E.
Environmental Coordinator
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Coral Gables, FL 33146
Telephone (305) 669-5711
FAX (305) 669-5717

Mr. David E. Lindberg, P.E
Project Engineer
CH2M HILL
701 B Street, Suite 700
San Diego, CA 92101
Telephone (619) 687-0110
FAX (619) 687-0111

The completed air permit application form is provided as Appendix A.

SECTION 2

Facility Description

2.1 General

Facility Name: Alexander Orr, Jr. Water Treatment Plant

Owner: Miami-Dade Water and Sewer Department

Contact: Ms. Bertha M. Goldenberg, P.E.
Environmental Coordinator
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Coral Gables, Florida 33146
Telephone (305) 669-5711
FAX (305) 669-5717

2.2 Site Description

The Alexander Orr, Jr. WTP is located at 6800 S.W. 87th Avenue in Miami, Florida. The area immediately surrounding the Alexander Orr, Jr. WTP consists of a mixture of residential, commercial, and light industrial uses. The plant is bound to the south by the intersection of the Don Shula Expressway and Sunset Drive, and to the east by 87^{th} Avenue. The plant is located approximately 7 miles south of the Miami International Airport, and is approximately 10 miles southwest of downtown Miami.

There are two sources of emissions at the plant: the lime kiln and several diesel engine-driven pumps. The lime plant produces lime (CaO) by pyrolysis of $CaCO_3$ (precipitate from the water treatment process) in a lime kiln. The diesel engine-driven pumps provide high pressure service directly to the distribution system. The location of these facilities is shown in Figure 2-1.

The layout of the Alexander Orr, Jr. WTP is shown in Figure 2-2. The Alexander Orr, Jr. WTP is a lime softening plant that consists of a lime plant (sludge thickening tanks, lime kiln, and lime silos), lime softening tanks, a filter gallery, chlorine contact basins, two chemical addition buildings, a generator switchgear building, two pump rooms (east and west), fuel storage tanks, and a railcar ammonia unloading rack.

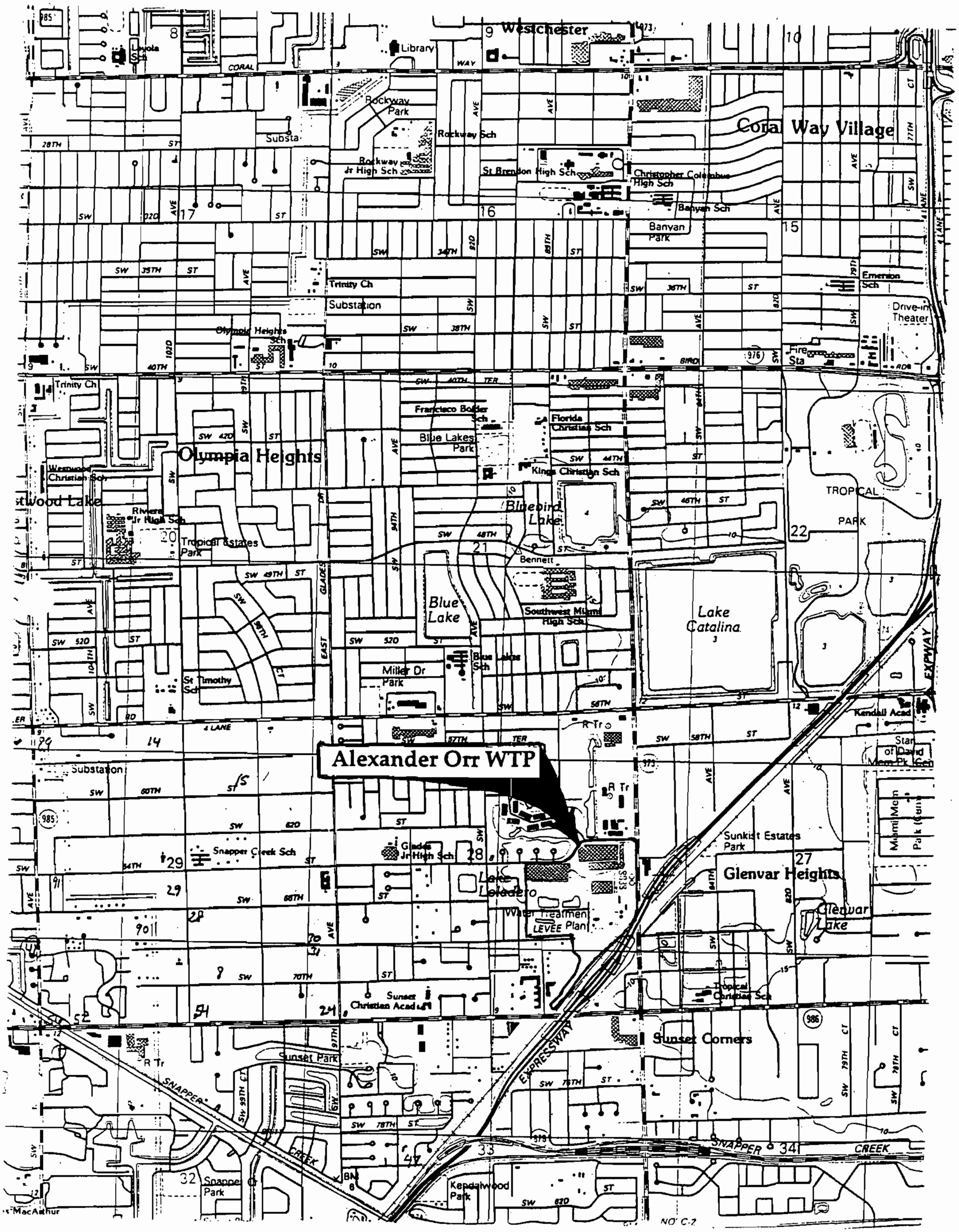

Figure 2-1
Site Location Map

CH2MHILL

04-08-98

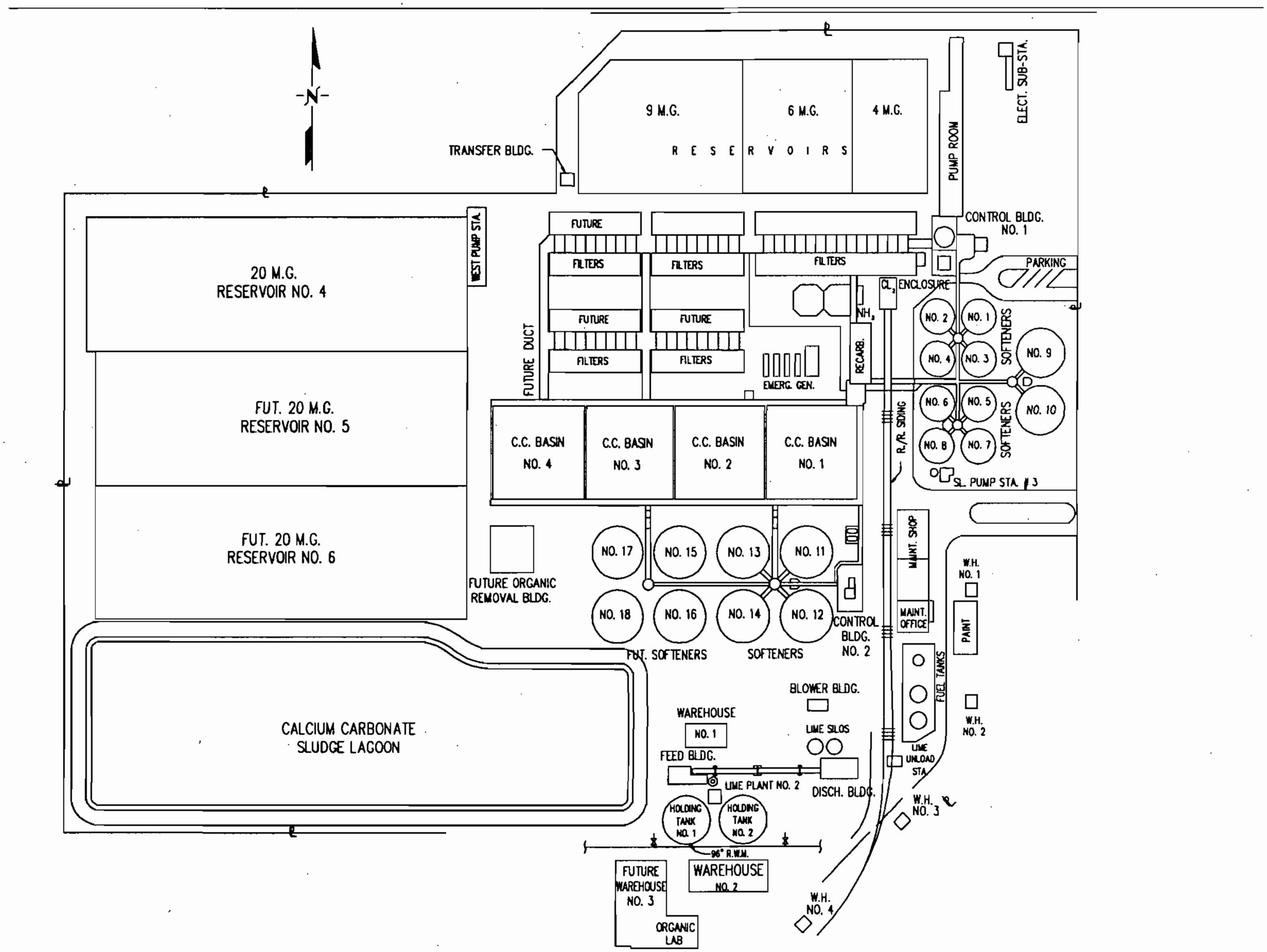

Figure 2-2

Site Layout Map
Alexander Orr, Jr. WTP

CH2MHILL

D:\139633.AP\AP05F01.DWG 1=5500.0

2.3 Description of the Standby Generators

The standby generator sources include four 4,000-bhp EMD Model 20-645F4B (20F4B) internal combustion (IC) engines, each coupled to a 2,865-kW continuous-rated electric generator. All engines are diesel-fueled, 20-cylinder, 2-cycle, and turbocharged. The 20F4B generator sets were installed in 1987 and, at that time, were intended for emergency standby use only.

Exhaust emissions will be controlled using Best Achievable Control Technology (BACT) for nitrogen oxides (NO_x), which will consist of fuel injection timing retard (IR) plus turbo-charger aftercoolers. In addition, the engines will continue to burn low sulfur (0.05 weight %) diesel fuel, which is representative of BACT for sulfur dioxide (SO_2). The combination of low-sulfur diesel fuel and combustion modifications is representative of BACT for particulate matter with a diameter less than 10 micrometers (PM-10). Use of BACT will reduce emissions of NO_x in the engine exhaust by approximately 28 percent from uncontrolled (pre-BACT) levels.

2.4 Operation

Table 2-1 summarizes the operating characteristics of each generator set. Table 2-1 shows that brake-specific fuel consumption (BSFC) increases as the engine loads are decreased.

This analysis conservatively includes an assessment of air quality impacts based on production of 40,110,000 kilowatt-hour (kW-hr) of electricity by the 20F4B standby generators. This level of operation corresponds to approximately 14,000 hours of 20F4B operation per year at full load conditions, and has been calculated based on application of BACT to historical emissions testing of the uncontrolled engines.

All four standby generator sets are located within individual enclosure structures. Exhaust silencers and stacks are mounted horizontally on top of each enclosure structure. The stacks have a 21-inch inside diameter and terminate approximately 15.5 feet above ground level.

Table 2-1
Summary of Exhaust and Operating Characteristics
EMD Model 20F4B Standby Generators
Miami-Dade WASD Alexander Orr, Jr. WTP

EMD Model 20F4B Generator Sets	
Number of Units	4
Generator Capacity	
Peaking (110% load–2 hours max)	3,150 kW, each
Continuous (full load–100%)	2,865 kW, each
Brake Specific Fuel Consumption (lb/bhp-hr)	
Peaking–110%	0.346, each
Full Load–100%	0.346, each
Partial Load–75%	approx. 0.363, each
Partial Load–50%	approx. 0.381, each
Minimum Load–20%	approx. 0.432, each
Operating Speed	900 rpm
Exhaust Characteristics–Horizontal Exhaust	
Height	4.72 m
	15.5 ft
Diameter	0.533 m
	1.75 ft
Flow	604.5 m^3/s
	45.1 ms
	21,350 acfm
	148 fps
Temperature	608°K
	635°F

Notes:
m = meter
ft = feet
m^3/s = *cubic meters per second*
m/s = meters per second
acfm = actual cubic feet per minute
fps = feet per second
rpm = revolutions per minute

SECTION 3

Emission Source Information

3.1 Standby Generator Set Emissions

3.1.1 Regulated Pollutants

A summary of the annual emissions from all three 20F4B generator sets operating under a range of load conditions is presented in Table 3-1. Because of air emissions, energy efficiency, and maintenance considerations, the IC engines will not be operated at partial loads less than 25 percent of their respective full load rating, except during startup and maintenance testing.

The estimates of emission rates were determined on the basis of the following assumptions:

- Uncontrolled NO_x emissions of 9.08 g/bhp-hr (based on historical stack test results)
- Reduction of NO_x emissions by 28 percent from uncontrolled levels and PM-10 emissions by 25 percent from uncontrolled levels using IR plus aftercoolers
- Reduction of SO_2 emissions by using low-sulfur diesel fuel (0.05 weight percent)
- All particulate emissions are less than or equal to 10 microns (PM-10)
- Annual power output of 40,110,000 kW-hr by all generator sets

Table 3-1
Comparison of Proposed Annual Emissions with PSD-Significant Emission Rates
EMD Model 20F4B Standby Generators

Pollutant	Emissions (tons/yr)[1] 25% load	50% load	75% load	100% load	Significant Emission Rate (tons/yr)
CO	24.3	19.7	18.5	17.3	100
NO_x	***151***	***310***	***339***	***403***	***40***
SO_2	4.4	9.8	9.8	9.8	40
PM/PM-10	4.5	10.0	10.0	10.0	25/15
VOC	6.7	15.0	15.0	15.0	40

[1]Annual power output of 40,110,000 kW-hr by all generators.
CO = carbon monoxide
VOC = volatile organic compound

Emissions data provided by the equipment manufacturer indicate that maximum power-specific emissions occur at minimum (25 percent) load conditions for CO and maximum load conditions for NO_X. No power-specific emissions data were provided for PM-10 or VOCs. Power-specific emissions of SO_2 decrease with increasing engine power output because of the decrease in BSFC (more efficient operation) for engine power output approaching the engine's rated capacity.

For all pollutants summarized in Table 3-1 except NO_x, maximum emissions are noted to occur when operating at minimum load. Maximum emissions of NO_x occur at full load conditions. Because no power-specific emissions data are available for PM-10 and VOCs, maximum emissions are assumed to coincide with minimum load operation.

As shown in Table 3-1, only emissions of NO_X are expected to exceed the corresponding PSD-significant emission rates. Detailed emissions calculations for the standby generators are provided in Attachment 11 of the Air Permit Application (see Appendix A).

Because NO_X emissions exceed PSD thresholds, the project is a major source as defined by the regulations governing PSD. As such, a PSD permit is required, including a demonstration of BACT, and an air quality impact analysis to demonstrate that there will not be a violation of any National Ambient Air Quality Standards (NAAQs) or exceedance of any PSD increments.

3.1.2 Non-regulated Pollutants

The U.S. Environmental Protection Agency (EPA) guidance on the assessment of non-regulated "toxic pollutants" requires that permit applicants evaluate emissions of toxic air emissions for those pollutants that the proposed source could emit in amounts potentially of concern to the public. In the case of IC engines, potential toxic air pollutants could include benzene, toluene, xylenes, formaldehyde, acetaldehyde, acrolein, propylene, and polycyclic aromatic hydrocarbons (PAHs). None of these pollutants are expected to be emitted in significant quantities. A more complete analysis of these non-regulated pollutants is provided in Section 6.

3.2 Other Emission Sources

To facilitate the determination of PSD increment consumption and compliance with the NAAQS in the vicinity of the Alexander Orr, Jr. WTP, an inventory of permitted emission sources was requested from the Florida Department of Environmental Protection (FDEP). The inventory, which included all emission sources in Broward and Miami-Dade Counties, was screened to identify sources with the potential to interact with emissions from the standby generators at the Alexander Orr, Jr. WTP. Based on FDEP guidance, all sources having an annual emission rate (in tons) less than 20 times their distance (in kilometers [km]) from the Alexander Orr, Jr. WTP were excluded from the air quality impact analysis on the basis that they would not likely have any significant impact on the area impacted by the standby generators. The resulting list of competing sources is provided in Table 3-2, and the relative location of these sources is shown in Figure 3-1.

Emissions from all sources listed in Table 3-2 were included in the air quality impact analysis to demonstrate that ambient concentrations of NO_2 at all receptors impacted by the standby generators will be below NAAQS. Sources installed or modified after the baseline date for NO_2 (March 28, 1988) were identified as "baseline" sources. Emissions from baseline sources were excluded from evaluation of PSD increment consumption because (by definition) they do not consume increment. Emissions from the PSD sources (non-baseline sources) were included in the air quality impact analysis to demonstrate that consumption of PSD increment resulting from operation of the standby generators will be within acceptable limits at all receptor locations.

Table 3-2
Regional Emission Source Inventory

Source	Location (UTM) Northing (km)	Location (UTM) Easting (km)	Emission Rate (g/s)	Stack Parameters Height (m)	Stack Parameters Temp (°K)	Stack Parameters Velocity (m/s)	Stack Parameters Diameter (m)	Baseline?
MDWASD Alexander Orr, Jr. WTP Pump Nos. 1, 3, & 4	2843.53	566.60	0.70	8.50	735	7.77	0.18	Yes
MDWASD Alexander Orr, Jr. WTP Pump Nos. 5 & 6	2843.57	566.60	2.30	8.50	735	5.97	0.24	Yes
MDWASD Alexander Orr, Jr. Lime Plant	2843.21	566.47	0.84	0.00	327	7.17	1.74	Yes
MDWASD Preston WTP Standby Generators	2857.11	571.49	10.68	3.5	608	45.2	0.53	No
MDWASD Central District WWTP Standby Gens	2847.79	584.95	10.81	6.40	663	16.52	0.91	No
South Broward County RRF	2883.3	579.6	68.55	59.44	381	18.0	3.96	No
North Broward County RRF	2907.6	583.6	64.00	58.5	381	18.0	3.96	No
Tarmac Kiln 1	2861.7	562.9	21.14	60.96	465	12.8	2.44	No
Tarmac Kiln 2	2861.7	562.9	12.89	60.96	422	9.11	2.44	No
Tarmac Kiln 3 Modified	2861.7	562.9	68.18	60.96	450	11.0	4.57	No
Tarmac Kiln 3 Baseline	2861.7	562.9	-60.80	60.96	472	10.78	4.57	Yes
Dade County RRF Kilns 1 & 2	2857.39	564.4	35.38	76.2	405	15.86	3.66	No
Dade County RRF Kilns 1 & 2 Baseline	2857.39	564.4	-22.50	45.72	472	12.20	2.74	Yes
Dade County RRF Kilns 3 & 4	2857.39	564.4	35.38	76.2	405	15.86	3.66	No
Dade County RRF Kilns 3 & 4 Baseline	2857.39	564.4	-22.53	45.72	472	12.20	2.74	Yes
Dade County RRF Kiln 5	2857.4	564.3	13.24	76.2	400	15.74	2.97	No
FP&L Ft Lauderdale CT 1-4	2883.3	580.1	135.7	45.72	411	10.97	4.88	No
FP&L Ft Lauderdale CT 1-12	2883.3	580.1	508.0	13.72	733	121.34	5.49	Yes
FP&L Ft Lauderdale CT 13-24	2883.3	580.1	508.0	13.72	733	121.34	5.49	Yes
FP&L Ft Lauderdale 4-5 Baseline	2883.3	580.1	-70.6	46.00	422	14.63	4.27	Yes
FP&L Cutler Unit 5	2834.9	570.4	51.15	45.72	408	11.58	4.57	Yes
FP&L Cutler Unit 6	2834.9	570.4	86.82	45.72	408	14.33	4.57	Yes
FP&L Port Everglades 1-2	2875.3	587.4	313.78	104.85	416	18.59	4.27	Yes
FP&L Port Everglades 3-4	2875.3	587.4	508.27	104.55	408	19.2	5.52	Yes
FP&L Port Everglades CT 1-12	2875.3	587.4	498.95	15.54	733	21.34	5.49	Yes
FP&L Turkey Point 1-2	2831.2	567.2	475.24	121.92	408	19.2	5.52	Yes
Rinker Kilns 1 & 2	2851.3	558.2	20.19	41.76	400	7.62	4.57	Yes
Lee County Resource Recovery Facility (Class I only)	2946.0	424.0	30.37	83.8	389	19.81	1.88	Yes
Bechtel Indiantown (Class I only)	2991.5	454.6	82.00	150.90	333	30.5	4.88	Yes
Okeelanta (Class I only)	2939.4	525.0	24.81	60.67	450	21.25	2.44	Yes
Osceola (Class I only)	2968.0	544.2	12.22	54.9	449	21.28	2.13	Yes

Notes:
UTM = Universal Transverse Mercator
g/s = grams per second
°K = degrees Kelvin

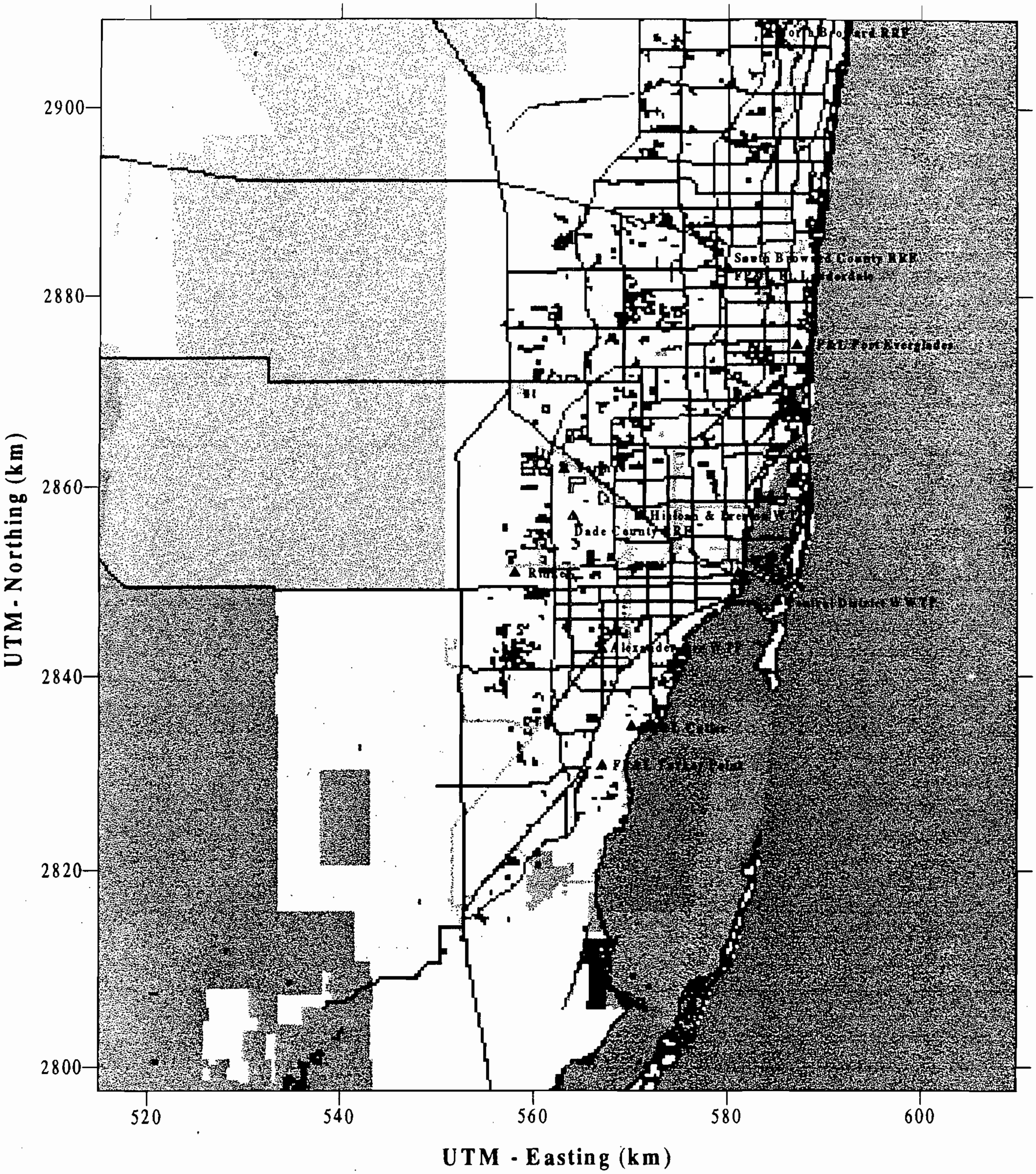

Figure 3-1
Map of Regional Emissions Sources

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SECTION 4

Applicable Regulations

4.1 Applicable Pollutants

Total allowable emissions of NO_x from the Alexander Orr, Jr. WTP are above the PSD trigger level of 250 tons/year. However, the standby generators by themselves constitute a major source of NO_x emissions under the regulations governing PSD (see Table 3-1). As a result, an ambient air quality impact analysis and demonstration of BACT are required for NO_x.

4.2 Air Quality Impact Analysis Requirements

Air quality regulations for which the proposed project must comply are the NAAQS for NO_2 (40 CFR 50 and Chapter 62-204.240(5), Florida Administrative Code [FAC]); and the PSD Class II and Class I increments for NO_2 (40 CFR 52 and Chapter 62-204.260, FAC). These limits are summarized in Table 4-1 along with the corresponding limits for SO_2 and PM-10. Analyses of the proposed emissions from the standby generators (Section 6) demonstrate that the standby generators will be in compliance with all state and federal ambient air quality regulations.

Table 4-1
Ambient Air Quality Standards and Significant Impact Levels[a]

Pollutant and Averaging Period	NAAQS		PSD Increments		Significant Impact Levels	
	Primary	Secondary	Class II	Class I	Class II	Class I[b]
SO_2						
3-hour	-	1,300[c]	512[c]	25[c]	25	1.0
24-hour	365[c]	-	91[c]	5[c]	5	0.2
Annual	80	-	20	2	1	0.1
NO_2						
Annual	100	100	25	2.5	1	0.1
PM-10						
24-hour	150[c]	150[c]	30	8	5	0.3
Annual	50	50	17	4	1	0.2

Notes:
Concentrations in micrograms per cubic meter ($\mu g/m^3$)
[a] 43 FR 26398
[b] Proposed by the National Park Service, July 23, 1996.
[c] Concentrations not to be exceeded more than once per year, on an average basis.

Also listed in Table 4-1 are the significant impact levels for each pollutant. The area of significant impact for the Alexander Orr, Jr. WTP consists of the area covered by all receptors having predicted concentrations in excess of the significant impact level of 1 $\mu g/m^3$ for NO_2. Where the ambient concentration of NO_2 at any receptor attributable to the standby generators is below 1 $\mu g/m^3$, the impact of the standby generators on that receptor is considered to be insignificant.

4.3 Emission Limits and Performance Standards

While there are no federal or state regulations specifically applicable to IC engines, any source subject to PSD is required to install or comply with BACT. A discussion of BACT for the standby generators is given in Section 5.

4.4 Monitoring Requirements

4.4.1 Pre-construction Monitoring

FDEP has indicated that data available from an air quality monitoring station located on Virginia Key are representative of air quality and meteorological conditions at the facility. Therefore, pre-application meteorological monitoring will not be required for this project.

Background levels of NO_2 at the Virginia Key monitoring station, provided by FDEP, are included in Section 6.5.3. These data were used in conjunction with dispersion modeling analyses of existing and permitted emission sources in the Miami area to demonstrate compliance with NAAQS.

4.4.2 Operational Monitoring

The Alexander Orr, Jr. WTP will comply with all applicable operational monitoring requirements imposed by federal and state regulations. Annual emissions monitoring will be conducted to verify compliance with BACT for NO_x. The facility will also comply with any other operational monitoring and reporting requirements as may be determined necessary by FDEP to ensure compliance with federal or state rules or regulations (such as maintaining documentation of diesel fuel sulfur content). This will include any applicable future monitoring, reporting, and recordkeeping required under Title V (Operating Permits) of the Clean Air Act (CAA) Amendments of 1990.

SECTION 5

Demonstration of BACT

5.1 General

Under PSD regulations, a new or modified "major source" is required to apply BACT for any pollutant emitted in "major" or "significant" amounts. As discussed in Section 3, the proposed standby generators have the potential to emit NO_x in "significant" quantities. A BACT analysis is therefore required for this pollutant.

The purpose of this review is to demonstrate that the air pollution control measures to be utilized at these facilities represent BACT as defined by Section 169 of the CAA:

> "An emission limitation (including a visible emissions standard) based on the maximum degree of reduction of each pollutant subject to regulations under the Act which would be emitted from any proposed major stationary source or major modification, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, economic impacts and other costs, determines is achievable for such source or modifications through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment of innovative fuel combination techniques for control technology resulting in emissions of any pollutant which will exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the EPA determines that technological or economic limitations on the application of measurement methodology to a particular emission unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirements for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results."

Both FDEP and EPA have indicated that demonstration of BACT as described must follow a "top-down" approach. The "top-down" process requires that all available control technologies be ranked in descending order of control effectiveness. This process ensures that the BACT demonstration considers the most stringent level of control technology available. That control option is established as BACT, unless it can be demonstrated that energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not achievable. The next most stringent alternative is then considered. The process continues until the BACT level under consideration cannot be eliminated by any substantial or unique economic or environmental objectives.

The purpose of this section is to demonstrate that the proposed emission control systems and methods will be representative of BACT. To facilitate the demonstration, information obtained from EPA's RACT/BACT/LAER Clearinghouse (RBLC) database for diesel engines is presented in Table 5-1. The following paragraphs summarize the control technology options available for diesel engines, and the proposed BACT for NO_x.

5.2 Nitrogen Oxides

NO_x is formed during the fuel combustion process in the presence of atmospheric nitrogen. Nitrogen and oxygen dissociate into their atomic states under high temperature and pressure conditions present inside combustion engines. Atomic oxygen and nitrogen quickly react with each other to form seven different oxides of nitrogen: nitric oxide (NO), nitrogen peroxide (NO_2), nitrogen trioxide (NO_3), nitrous oxide (N_2O), nitrogen anhydride (N_2O_3), N_2O_4, and N_2O_5. Only NO and NO_2 are formed in significant quantities, and NO accounts for approximately 95 percent of total NO_x emissions. NO is eventually converted to NO_2 in the atmosphere.

5.2.1 Selective Catalytic Reduction

The RBLC database indicates that the top method of controlling emissions of NO_x from diesel engines is selective catalytic reduction (SCR). The database indicates that SCR has been applied to diesel engines at a single facility in Philadelphia, Pennsylvania (PA-0096 and 0097 in Table 5-1).

Table 5-1
Summary of NO_x Control Technology Determinations for Diesel Engines as of 7/6/97

RBLC ID	Permit Date	Process	Pollutant	Primary Emissions		Control Description	% Effic	Basis
AK-0026	7/26/93	Generator, Wartsilla #2 & #6	NO_2	135	lb/hr	3 Degree Timing IR	66	BACT-PSD
AK-0026	7/26/93	Generator, Transportable	NO_x	26.3	lb/hr	Restricted to 3,000 Hrs/Yr	0	BACT-PSD
AK-0026	7/26/93	Generator, Caterpillar #1, #2 & #3	NO_x	71.1	lb/hr	Restricted to 1,690,000 kW-hr	0	BACT-PSD
AK-0028	6/21/96	6.5 mW Power Generation, Diesel	NO_2	632.6	tons/yr	Limit Operating Hours; Aftercoolers	0	BACT-PSD
AK-0029	6/27/96	3.4 mW Power Generation, Diesel	NO_2	427	tons/yr	Aftercoolers	0	BACT-PSD
CA-0417	12/2/91	410 hp Diesel Generator, Emergency	NO_x	0.0		Turbo/Aftercooler, 4 Deg. Timing IR	40	BACT-PSD
CA-0422	1/6/92	211 bhp @ 1800 Rpm Diesel Generator	NO_x	2.88	lb/hr	Timing IR, Turbo/Water Injection	64	BACT-PSD
CA-0453	12/2/91	410 hp Diesel Engine	NO_x	0.0		Turbo/Aftercooler	40	BACT-PSD
CA-0562	6/18/93	953 bhp Engine	NO_x	6.6	g/bhp-hr	Turbo/Aftercooler, 4 Deg Timing IR	40	BACT-OTH
CA-0586	6/15/93	Generator, Diesel	NO_x	4.0	degrees IR	4 Degree Timing IR	0	BACT-OTH
HI-0011	11/25/91	7.86 mW Diesel Engine Generators (4)	NO_x	590	ppmvd	Variable IR, Turbo/Aftercooler	18.6	BACT-PSD
HI-0016	11/8/95	2.2 mW Diesel Engine Generators (3)	NO_x	656	ppmvd	Timing IR; Intake Air Cooling	0	BACT-PSD
HI-0017	5/4/96	2.2 mW Diesel Engine Generators (3)	NO_x	656	ppmvd	Timing IR; Intake Air Cooling	0	BACT-PSD
MN-0022	3/1/95	2.7 MMBtu/Hr Diesel Fire Pump	NO_x	5.0	lb/hr	Timing IR; Turbo/Aftercooling	0	BACT-PSD
NY-0044	6/6/95	3000 kW Generator, Emergency	NO_x	2.6	lb/MMBtu		0	LAER
NY-0047	9/1/92	1.3 MMBtu/Hr Diesel Fire Pump	NO_x	1.3	lb/MMBtu	Lean Burn Engine	0	BACT-OTH
NY-0047	9/1/92	1.5 MMBtu/Hr Nat. Gas Emgcy Gen.	NO_x	1.3	lb/MMBtu	Lean Burn Engine	0	BACT-OTH
NY-0072	12/10/94	22.00 MMBtu/Hr Diesel Generator	NO_x	1.166	lb/MMBtu	No Controls	0	BACT-OTH
NY-0072	12/10/94	1.5 MMBtu/Hr Fire Pump	NO_x	4.25	lb/MMBtu	No Controls	0	BACT-OTH
PA-0083	5/3/91	1135 kW Diesel Generators (2)	NO_x	36	lb/hr each		0	OTHER
PA-0096	10/15/92	1156 kW Diesel Engines (11)	NO_x	2.0	g/bhp-hr	Selective Catalytic Reduction	80	BACT-OTH
PA-0097	10/15/92	1635 kW Diesel Engines (7)	NO_x	2.0	g/bhp-hr	Selective Catalytic Reduction	80	BACT-OTH
SC-0027	7/15/92	400 kW Diesel Generator, Emergency	NO_x	13.1	lb/hr		0	BACT
VA-0191	1/28/93	1200 kW Diesel Generators (3)	NO_x	137.3	lb/hr	Turbo/Aftercooler	0	BACT-OTH
VA-0207	7/30/93	748,000 Gal/Yr Diesel Generators (6)	NO_x	33.2	lb/hr	5 Degree Timing IR	21.7	NSPS
WI-0083	11/23/94	Diesel Generator, Back-Up	NO_x	67.5	lb/hr	Low Sulfur (0.05%) Diesel Fuel	0	BACT-PSD

Source: U.S. EPA RACT/BACT/LAER Clearinghouse

SCR process reduces NO_x emissions by injecting ammonia (NH_3) into the exhaust stream, where the NH_3 and NO_x react in the presence of a catalyst to form water and nitrogen:

$$NH_3 + NO_x \text{ -----> } N_2 + H_2O \text{ (unbalanced)}$$

The catalyst reactor is usually a honeycomb configuration consisting of either a ceramic or metal substrate and the active catalyst coating. Several types of catalysts are available, including vanadium oxides, titanium oxides, or precious metals. Zeolite catalysts are also available in which the catalyst is distributed uniformly throughout the extruded crystalline reactor structure. Because SCR requires the injection of ammonia upstream of the reactor, an ammonia injection system and storage facilities are required.

The presence of higher oxygen concentrations in the exhaust of lean-burn engines (all diesel engines) makes SCR applicable. SCR applies most effectively to natural-gas-fired lean-burn engines with constant load carrying operation. NO_x emission reduction levels from SCR typically range from 75 percent to 95 percent without any corresponding increase in hydrocarbon (HC) or CO emissions. NH_3 concentrations in the exhaust typically range from 20 to 30 parts per million (ppm). Backpressure on the engine increases by approximately 2 to 4 inches water with installation of SCR. A 0.5 percent increase in BSFC is associated with the 4-inch backpressure, and power output is estimated to decrease by approximately 2 percent for turbocharged engines.

Fuel characteristics and engine duty cycle may reduce the effectiveness of SCR technology. Contaminants present in diesel fuel and engine lube oils, including sulfur, phosphorus, and ash, can poison or mask the surface of the catalyst and reduce or terminate its activity. Fuel sulfur, which oxidizes to SO_2 during combustion, is oxidized to sulfite (SO_3) in some catalysts and reacts with NH_3 to form ammonium sulfate and ammonium bisulfate salts. These salts form a coating over the catalyst surface, reducing its effectiveness. Particulate emissions from diesel engines also mask or foul surfaces of the catalyst.

Because exhaust temperature and NO_x emissions are a function of engine power output, variable load applications may also cause exhaust temperatures and NO_x concentrations that pose a problem for SCR. Under varying load situations, off-stoichiometric quantities of NH_3 are injected into the exhaust, leading to either reduced NO_x reduction efficiency or the release of unreacted NH_3 in the exhaust (commonly called "ammonia slip"). The Alexander

Orr, Jr. WTP standby generators will accommodate fluctuations in load, which may result in exhaust temperatures outside the range for optimum catalyst performance. Because of these technical problems, SCR is not well-suited for the standby generators and is not representative of BACT.

5.2.2 Fuel Injection Timing Retard/Combustion Air Precooling

The next most stringent method of controlling emissions of NO_x is a combination of IR and precooling of combustion air. As shown in Table 5-1, this combination of NO_x emission control technologies is the second most stringent technology applied to diesel engines.

In a diesel engine, injection of fuel into the cylinder starts the combustion process. Retarding the timing of fuel injection until the piston is in its downward motion increases the volume of the combustion chamber, which reduces combustion temperature and pressure, subsequently reducing the formation of NO_x. However, IR generally increases black smoke and cold smoke (white smoke during start up) emissions, as well as increasing exhaust temperatures. The increase in exhaust temperatures affect turbocharger performance and may be detrimental to exhaust valve life. A 2 percent increase in BSFC and a 25 percent increase in particulate emissions usually result from the application of IR alone to diesel engines. To counteract this problem, it has been demonstrated that the installation of a device to cool the combustion air upstream of the cylinder alleviates most of the negative side effects of IR.

In large-bore diesel engines equipped with a turbocharger, the combustion air precooler consists of a heat exchanger located downstream of the turbocharger, and is typically referred to as an aftercooler. Cooler air box temperatures reduce bulk combustion temperature, which reduces NO_x formation. Because cooler air is denser, the cylinders are charged with a greater mass of air that generally helps reduce emissions of unburned HC, CO, and particulate matter. Manufacturer's test results of the 20F4B-series engines have shown that installation of four-pass aftercoolers piped to the engine's cooling system reduce uncontrolled emissions of NO_x and PM-10 by up to 10 percent while slightly lowering BSFC (0.5 to 1.0 percent). Tests have also shown that combining a 4-degree IR with the installation of a four-pass aftercooler will reduce NO_x emissions by 28 percent and PM-10 emissions by

7 percent with a slight decrease in BSFC. Documentation of the aftercooler technology is included in Attachment 11 of the Air Permit Application (Appendix A).

5.2.3 Cost-Effectiveness Analysis

A cost-effectiveness comparison analysis of SCR and Fuel Injection Timing Retard/ Combustion Air Precooling has been performed for this application. Total annual costs of each technology have been determined in accordance with procedures outlined in the *EPA Office of Air Quality Planning & Standards Cost Control Manual*. Purchased equipment cost (PEC) information and estimated NO_x reduction efficiencies were obtained from vendors of each type of technology.

Total capital cost estimates are summarized in Table 5-2. The estimates have been scaled up from the PEC proposals for each technology. The total capital costs are $87,400 for proposed BACT, and $2,610,000 for SCR. Total annual costs are summarized in Table 5-3. These costs include various operating (direct annual) costs and capital recovery (indirect annual) costs, and are estimated to be $23,000 for proposed BACT and $773,000 for SCR.

The cost-effectiveness of each technology is summarized in Table 5-4. Cost-effectiveness establishes a monetary value for each technology in terms of cost per ton of pollutant removed that facilitates the ranking and selection of technologies. Emissions calculations are summarized in Table 5-5. The cost-effectiveness of SCR at $1,585 per ton is approximately 11 times higher than the cost-effectiveness of proposed BACT ($143 per ton).

Because of the technical problems associated with the use of SCR for this application, as discussed in Section 5.2.1, and the relatively high cost-effectiveness of this technology in comparison to combustion modifications, as discussed above, retarded fuel injection timing and combustion air precooling is proposed as BACT.

Table 5-2
Total Capital Cost Estimates
Alexander Orr, Jr. WTP Standby Generators
Miami-Dade Water and Sewer Department

	4 deg IR + Combustion Air Precoolers		SCR	
Direct costs				
Purchased equipment cost (PEC)[1]	$	44,137.93	$	1,320,000.00
Control device and auxilary equipment				
Instrumentation				
Sales Taxes (3% of PEC)				
Freight (5% of PEC)				
Direct installation cost[2]	$	19,862.07	$	594,000.00
Foundations and supports				
Handling and erection				
Electrical				
Piping				
Insulation for ductwork				
Painting				
Total direct cost	**$**	**64,000.00**	**$**	**1,914,000.00**
Indirect costs				
Indirect installation costs[3]	$	14,565.52	$	435,600.00
Engineering				
Construction and field expenses				
Contractor fees				
Start up				
Performance test				
Model study				
Training				
Contingencies[4]	$	8,827.59	$	264,000.00
Equipment redesign and modifications				
Cost escalations				
Delays in start up				
Total Indirect Cost	**$**	**23,393.10**	**$**	**699,600.00**
Total Capital Cost	**$**	**87,393.10**	**$**	**2,613,600.00**

[1] Includes four SCR systems, four Continuous Emissions Monitoring Systems, and a 17,000-gallon anhydrous ammonia tank.

[2] Direct installation cost assumed equal to 45% of PEC.

[3] Indirect installation cost assumed equal to 33% of PEC.

[4] Contingency costs assumed equal to 20% of PEC.

Table 5-3
Total Annual Cost Estimates
Alexander Orr, Jr. WTP Standby Generators
Miami-Dade Water and Sewer Department

	Cost		Unit		4 deg IR + Combustion Air Precoolers		SCR
Total Operating Hours (all four engines)					14,349		14,349
Direct annual costs							
Utilities							
Electricity @ 20 kW[1]	$	0.06	kW-hr	$	-	$	17,218.80
Diesel fuel[2]	$	0.77	gallon	$	-	$	9,881.08
Anhydrous ammonia @ 23 lb/hr each	$	275.00	ton	$	-	$	45,378.71
Operating labor							
Operating labor[3]	$	30.39	hr	$	-	$	4,964.75
Supervising labor[4]				$	-	$	744.71
Maintenance[5]				$	1,807.46	$	54,054.45
Annual compliance test (one engine)				$	3,000.00	$	3,000.00
Catalyst replacement[6]				$	-	$	90,090.75
Catalyst disposal[7]	$	0.15	lb	$	-	$	3,840.00
Total direct annual costs				**$**	**4,807.46**	**$**	**229,173.26**
Indirect annual costs							
Overhead[8]				$	1,084.48	$	32,432.67
Property tax[9]				$	873.93	$	26,136.00
Insurance[10]				$	873.93	$	26,136.00
Administrative charges[11]				$	1,747.86	$	52,272.00
Capital recovery[12]	0.15582009			$	13,617.60	$	407,251.39
Total Indirect Annual Costs				**$**	**18,197.80**	**$**	**544,228.06**
Total Annual Cost				**$**	**23,005.27**	**$**	**773,401.32**

1 Vaporizer and instrumentation electrical requirement, 14,350 total hours of operation.

2 No fuel penalty for IR; fuel penalty of 0.5% for SCR based on 5-inch water backpressure, 14,350 total. hours of operation, and BSFC = 0.346 lb/bhp-hr.

3 Assumes 3 hrs per 8-hr shift for SCR, 14,350 hours operation per year. No labor for IR.

4 Supervisor labor is 15% of operator labor.

5 Maintenance costs are 10% of Purchased Equipment Costs, prorated by the number of hours of operation.

6 Catalyst replacement every 8,760 hours of operation per engine.

7 Assume catalyst density 100 lb/cf. Total weight = (4 modules/engine)(1,600 lb/module)(4 engines) = 25,600 lb.

8 Overhead charge rate is 60% of maintenance costs.

9 Property tax is estimated to be 1% of total capital costs.

10 Insurance is estimated to be 1% of total capital costs.

11 Administrative costs are estimated to be 1% of total capital costs.

12 Capital recovery cost is calculated at an interest rate of 9% for a lifetime of 10 years.

Table 5-4
Cost-Effectiveness Comparison
Alexander Orr, Jr. WTP Standby Generators
Miami-Dade Water and Sewer Department

		4 deg IR + Combustion Air Precoolers	SCR
NOx Emissions			
Uncontrolled	tons/yr	574	574
% Reduction		28%	85%
Controlled	tons/yr	413	86
Reduction	tons/yr	161	488
Total Annual Cost	$000/yr	$ 23.0	$ 773
Cost Effectiveness		**$ 143**	**$ 1,585**

Table 5-5
NO_x Emissions from Four 20F4B Standby Generators
Alexander Orr, Jr. WTP Standby Generators
Miami-Dade Water and Sewer Department

		Uncontrolled Emissions				Controlled Emissions		
Control Technology	Reference	Factor (g/bhp-hr)	lb/hr	tons/yr	Efficiency	Factor (g/bhp-hr)	lb/hr	tons/yr
SCR	Historical Data	9.08	80.0	574	85%	1.4	12.0	86
Combustion Modifications	Historical Data	9.08	80.0	574	28%	6.5	57.6	413

SECTION 6

Air Quality Impact Analysis

The dispersion modeling analyses documented herein were designed to assess the potential impact on air quality of the standby generator sets at the Alexander Orr, Jr. WTP in Miami, Florida. Prior to initiation of the air quality impact analysis as described herein, a modeling protocol was submitted to FDEP for review and approval. A copy of the modeling protocol approved by FDEP is included in Appendix B. The dispersion models, meteorological data, modeling methodology, and results of the air quality impact analyses are discussed in the following subsections. Selected sections of the dispersion modeling input and output files are contained in Appendix C.

6.1 Dispersion Model

Dispersion modeling results were obtained using EPA's short-term Industrial Source Complex Model (ISCST3), version 96113 (EPA, 1996). The ISCST3 model was used to determine long-term (annual average) concentrations only, as NO_2 has a single annual average standard.

6.2 Meteorological Input Data

The meteorological database used in the air quality modeling analyses consisted of 5 years (1987 to 1991) of surface observations from Miami International Airport (MIA), and upper air data from West Palm Beach, Florida, as recommended by FDEP. The south end of MIA is approximately 10 km north of the proposed project site. These data were processed by EPA's meteorological data preprocessor program PCRAMMET.

6.3 Receptor Grids

A polar-based receptor grid with a radial spacing of 10 degrees (i.e., 10°, 20°, 30°, etc.) was used for all analyses. Initial modeling was performed with a coarsely-defined receptor grid. The coarse grid consists of receptors located at 50-meter (m) spacings along the property fenceline, and along each of the 36 radials at the following distances:

- 250 m spacings from r = 250 m to r = 2,500 m
- 500 m spacings from r = 2,500 m to r = 5,000 m
- 1,000 m spacings from r = 5,000 m to r = 16,000 m

In addition, 28 receptors along the northern and eastern boundaries of the Everglades National Park Class I area and 4 receptors located within the northeast corner of the park were included in the modeling analysis.

Subsequent refined modeling was performed using a refined receptor grid with receptors out to the maximum radius of significant impact. The fine grid consists of receptors located at 50-m spacings along the property fenceline, and along each of the 36 radials at the following distances:

- 100 m spacings from r = 200 m to r = 1,000 m
- 250 m spacings from r = 1,000 m to r = 2,500 m
- 500 m spacings from r = 2,500 m to r = 5,000 m
- 1,000 m spacings from r = 5,000 m to r = 9,000 m

There were no offsite receptors located within 100 m of the standby generators.

6.4 Other Modeling Considerations

The ISCST3 model contains options that determine the way in which calculations are made. The choice of options was made consistent with EPA's current recommended approach, including the regulatory default option. The options utilized in the analysis included stack tip downwash, final plume rise, buoyancy-induced dispersion, and rural stability coefficients. The ISCST3 calms processor was used to account for calm winds in the calculations. Terrain elevations were omitted from the model because of the relatively flat topography of the area. Rural stability coefficients were used.

Emissions from the standby generators are released from the four identical 15.5-foot 20F4B exhaust stacks approximately 25 feet apart. For modeling purposes, the standby generators were modeled as a single point source with all emissions occurring at the geometric center of the four stacks. Based on the dimensions of adjacent structures, these stacks are influenced by downwash effects from the switchgear building and the adjacent softening tanks. The 20F4B stacks are within good engineering practice (GEP) stack height. The dispersion modeling incorporates the effects of building wake and downwash attributable to these buildings.

Emissions from five engine-driven pumps in the East Pump Room were also included in the refined modeling as baseline sources. These engines operate under FDEP operating permit AO13-177245, which does not define limits on emissions of any pollutants. The physical characteristics of these engines are listed below:

- Engine No. 1–Worthington 825-bhp diesel engine
- Engine No. 2–out of service
- Engine No. 3–Worthington 825- bhp diesel engine
- Engine No. 4–Worthington 825- bhp diesel engine
- Engine No. 5–Worthington 1,500- bhp diesel engine
- Engine No. 6–Enterprise 2,115- bhp dual fuel engine

All five engines are equipped with vertical exhaust stacks on the exterior of the East Pump Room west wall. The stacks terminate a few feet above the building rooftop, and emissions from all five are influenced by building downwash effects from the East Pump Room.

The Alexander Orr, Jr. WTP operates the pump engines according to the following policy: continuous operation of *either* Pump No. 5 *or* Pump No. 6, *and* operation of one smaller pump (Nos. 1, 3, or 4) approximately 50 percent of the time. A construction permit application for the engine-driven pumps has been prepared and submitted with this application for the standby generators to establish emissions limits consistent with this level of operation. Emissions from the engine-driven pumps modeled in the air quality impact analysis also reflect this level operation. Pump Nos. 5 and 6 have been modeled as a single source, as the engines are close to each other and one limit is proposed for both engines. Emissions from Pump Nos. 1, 3, and 4 have also been modeled as a single source for the same reasons.

Because the exhaust stacks are along the East Pump Room exterior walls and the stacks terminate slightly above the building rooftop, building wake and downwash effects have a significant effect on model-predicted concentrations at short-distance receptor locations. As such, the dispersion modeling was designed to incorporate such effects. As stated in the *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, Volume II–Description of Model Algorithms*, the ISCST3 models are not appropriate for estimating concentrations within the highly turbulent and generally recirculating building cavity region. According to the user's guide, this region extends for a distance of three times the building height for squat buildings (buildings that have a larger horizontal dimension than vertical dimension).

Because the height of East Pump Room is 8.4 m (28 feet), any receptors located within 25 m (82 feet) of the building are within this wake zone.

Emissions from the Alexander Orr, Jr. Lime Plant were also included in the refined modeling as a baseline source. Emission point characteristics for the lime kiln are given in Table 3-2.

6.5 Dispersion Modeling Methodology and Results

The dispersion modeling results reported in this section are based on the exhaust and operating characteristics for the 20F4B engine presented in Table 2-1, emissions data for full load 20F4B operation presented in Table 3-1, and exhaust and emissions data from regional sources presented in Table 3-2. It is noted that emissions from the 20F4B standby generators also are representative of BACT as demonstrated in Section 5.

The modeling analyses described in this report were performed to satisfy three objectives to determine or demonstrate: 1) the maximum impact and radius of significant impact of the proposed sources during maximum/full load operation, 2) compliance with PSD increment consumption in the area surrounding the sources, and 3) compliance with the NAAQS. In accordance with EPA and FDEP guidance, if maximum predicted impacts because of the operation of the proposed sources are found to be less than the EPA-defined significant impacts, further modeling analysis to demonstrate compliance with the applicable PSD increments and NAAQS is not required.

Initial modeling was performed using an emission rate of 1 g/s. The results were adjusted to the annual average NO_x emission rate of 11.6 g/s to obtain conservative estimates of predicted concentrations. In accordance with the *Multi-Tiered Screening Approach for Estimating Annual NO_2 Concentrations from Point Sources* (60 FR 40469), total conversion of NO_x-to-NO_2 was assumed for the initial or "tier 1" screening. However, subsequent refined modeling revealed that this assumption resulted in exceedance of PSD Class II increment. Therefore, an empirically-derived NO_x-to-NO_2 conversion of 75 percent was used for the "tier 2" screening to adjust the model results. Using this assumption, model-predicted NO_x concentrations were multiplied by 0.75 to obtain NO_2 concentrations at each receptor.

6.5.1 Maximum Impact and Radius of Significant Impact

The maximum impact and radii of significant impact for NO_x emissions from the proposed sources was determined by modeling the maximum expected emissions under full load as presented in Table 3-1. After installation of BACT, it is estimated that each generator will emit a maximum of 57.6 lb/hr (7.26 g/s) NO_x. Because the generator sets will be limited to 40,110,000 kW-hr power output annually, which corresponds to 3,500 hours per year (each) at full load, the equivalent annual-average emissions are 11.6 g/s NO_x (total).

The results of the screening analysis are summarized in Table 6-1. Using 1987 through 1991 meteorological data, predicted offsite concentrations attributable to the standby generators exceeded the significant impact levels up to a maximum radius of 7,000 m. The highest offsite NO_2 concentration is predicted to be 23.7 micrograms per cubic meter ($\mu g/m^3$). The maximum NO_2 concentration associated with emissions from the standby generators in the Class I area, as predicted in the screening analysis, is 0.34 $\mu g/m^3$.

Table 6-1
Summary of Initial NO_2 Dispersion Modeling Results–Annual Average
EMD Model 20F4B Standby Generators

	Significant Impact	Maximum Predicted 1987	1988	1989	1990	1991
Everglades National Park Class I Area ($\mu g/m^3$)	0.1	0.28	0.22	0.27	0.34	0.25
Class II Area ($\mu g/m^3$)	1.0	15.1	21.0	23.7	20.8	17.7
Radius of Significant Impact (m)	-	5000	6000	7000	6000	5000

Notes:
Q_s = 11.6 g/s NO_x
NO_2:NO_x = 0.75
Total annual power output 40,110,000 kW-hr

6.5.2 PSD Increment Consumption

Federal regulations (40 CFR 52) specify that the air quality of an area cannot deteriorate by more than a specified amount by establishing "PSD increments." A PSD increment is an acceptable level of air quality degradation in an area. These increments, which were summarized in Table 4-1, represent the maximum allowable increase in ambient concentration in an area (by pollutant and averaging period) since the regulations were enacted in 1977, or since the first PSD-increment-consuming source was permitted, whichever is later.

Currently, PSD increments exist for NO_2, SO_2, and PM-10. Prior to the issuance of a construction permit for a major new or modified source, a facility must demonstrate that the

PSD increments are not exceeded in the area as a result of the operation of the proposed new or modified facility.

Along with the standby generators, 11 increment-consuming sources were modeled to determine increment consumption in the Everglades National Park Class I area and surrounding Class II area (see Table 3-2). The maximum predicted NO_2 increment consumption results were compared to the allowable increment consumption criteria for receptors in each respective area. Results of the dispersion modeling analysis for increment consumption in the Everglades Class I area and the surrounding Class II area are presented in Table 6-2.

The analysis illustrates that the maximum predicted consumption of NO_2 increment in the Class I area is 0.86 $\mu g/m^3$, which is less than the 2.5 $\mu g/m^3$ allowable PSD Class I increment consumption limit. The highest increment consumption is observed near the northeast corner of the Everglades National Park Class I boundary, approximately 17 km west of the Alexander Orr, Jr. WTP.

The maximum predicted consumption of NO_2 increment in the Class II area is 24.1 $\mu g/m^3$, which is observed along the property fenceline approximately 204 m northwest of the standby generators. Predicted increment consumption decreases rapidly with increasing distance from the source.

At the receptor with the highest increment consumption, the standby generators consume 98 percent of the increment, and offsite baseline sources consume 2 percent of the increment. The maximum predicted increment consumption at this receptor is below the PSD Class II criteria of 25 $\mu g/m^3$.

6.5.3 Compliance with NAAQS

The proposed facility must comply with NAAQS for NO_2, SO_2, PM-10, CO, lead (Pb), and ozone (40 CFR 50), which are the same air quality standards that have been adopted by the State of Florida (refer to Table 4-1 for the NAAQS). However, the dispersion modeling analysis only evaluated NO_2, as it was the only pollutant emitted in significant quantities. The approach used to demonstrate compliance with NAAQS in the area impacted by the standby generators at the Alexander Orr, Jr. WTP was to assess the combined impact of 1)

Table 6-2
NO_2 Increment Consumption in Everglades National Park Class I and Surrounding Class II Areas
EMD Model 20F4B Standby Generators

	PSD Increment Consumption ($\mu g/m^3$)				
	1987	**1988**	**1989**	**1990**	**1991**
Everglades National Park Class I Area Increment Consumption					
20F4B Standby Generators	0.30	0.23	0.29	0.38	0.27
Other Sources	0.31	0.36	0.22	0.48	0.48
Class I Area Total	0.61	0.60	0.51	0.86	0.75
Location	(17,019 m, 288 deg)	(17,019 m, 288 deg)	(16,020 m, 268 deg)	(17,019 m, 288 deg)	(17,019 m, 288 deg)
Allowable PSD Class I Limit	2.50	2.50	2.50	2.50	2.50
Class II Area Increment Consumption					
20F4B Standby Generators	15.7	20.9	23.7	20.7	17.6
Other Sources	0.5	0.5	0.4	0.6	0.7
Class II Area Total	16.2	21.4	24.1	21.3	18.3
Location	(200 m, 300 deg)	(204 m, 317 deg)	(204 m, 317 deg)	(204 m, 317 deg)	(201 m, 304 deg)
Allowable PSD Class II Limit	25.0	25.0	25.0	25.0	25.0

Notes:
Q_a = 11.6 g/s NO_2
NO_2:NO_x = 0.75
Total annual power output 40,110,000 kW-hr

the proposed facility, 2) all existing emission sources in the area as identified by FDEP, and 3) existing background air quality.

Along with the standby generators, 27 sources were modeled to determine the ambient concentration of NO_2 in the Class II area (see Table 3-2). An additional four sources were modeled to determine the ambient concentration of NO_2 in the Everglades National Park Class I area. A summary of the dispersion modeling results for all existing and permitted sources of emissions is provided in Table 6-3. The estimates in the table are conservatively based on the sum of the maximum predicted concentrations attributable to the standby generators, the maximum predicted impact of all other regional sources, and the background levels of NO_2 in the Miami area.

The maximum predicted annual average NO_2 concentration in the Everglades National Park Class I area is 16.4 $\mu g/m^3$, most of which is associated with background NO_2 (72 percent). Offsite permitted sources account for 26 percent of the concentration, and the standby generators account for approximately 2 percent.

The maximum predicted annual average NO_2 concentration in the surrounding Class II area is 99.5 $\mu g/m^3$, which is slightly below the NAAQS of 100 $\mu g/m^3$. This concentration occurs on the property fenceline 195 m north of the standby generators along S.W. 64th Street (Hardee Road). The relatively high concentration at this receptor is primarily caused by the engine-driven pumps, which account for approximately 80 percent of the concentration at this receptor. The standby generators account for only 4.5 percent of the concentration at this receptor. Offsite sources and background account for 3.5 percent and 12 percent of the concentration at this receptor, respectively. Background NO_2 concentration data were obtained using the 1997 ALLSUM database entry for the Rosenstiel School-Virginia Key monitoring station.

6.5.4 Air Toxics Impact Assessment

EPA guidance on the assessment of non-regulated "toxic pollutants" requires that permit applicants evaluate emissions of toxic air pollutants that could be emitted in amounts potentially of concern to the public. Additional information is therefore provided on the potential impacts of the following toxic pollutants that may be emitted from diesel engines: benzene, toluene, xylenes, formaldehyde, acetaldehyde, acrolein, and PAHs.

Table 6-3
Comparison of Ambient NO_2 Concentrations with NAAQS
EMD Model 20F4B Standby Generators

	Ambient Concentration (μg/m³)				
	1987	1988	1989	1990	1991
Everglades National Park Class I Area					
Alexander Orr, Jr. WTP	0.40	0.32	0.40	0.53	0.36
Offsite Sources	3.37	3.12	2.46	3.87	3.76
All Sources	3.37	3.44	2.86	4.40	4.13
Background Concentration	12.0	12.0	12.0	12.0	12.0
Maximum Predicted Concentration	15.4	15.4	14.9	16.4	16.1
Location	(17,019 m, 288 deg)	(17,019 m, 288 deg)	(17,019 m, 288 deg)	(16,020 m, 268 deg)	(17,019 m, 288 deg)
Class II Areas					
Alexander Orr, Jr. WTP	68.1	65.5	77.6	79.2	84.2
Offsite Sources	2.5	2.6	2.4	2.7	3.3
All Sources	70.6	68.1	80.0	82.0	87.5
Background Concentration	12.0	12.0	12.0	12.0	12.0
Maximum Predicted Concentration	82.6	80.1	92.0	94.0	99.5
Location	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)
NAAQS - NO_2	100.0	100.0	100.0	100.0	100.0

Notes:
[1] Includes standby generators, cogeneration engines, and diesel blower engines
Q_s = 11.6 g/s NO_x
NO_2:NO_x = 0.75
Annual power output 40,110,000 kW-hr

FDEP has an air toxics policy, the purpose of which is to evaluate the potential impacts of hazardous air pollutants (HAPs) during the new source (construction) permitting process. The policy requires that new and modified sources seeking approval to construct air emission facilities demonstrate that, for compounds included in the Florida Air Toxic Working List, maximum offsite 8-hour average, 24-hour average, and annual average concentrations do not exceed acceptable ambient reference concentrations (ARCs) adopted by the State.

Estimates of short- and long-term air toxic emissions and maximum predicted concentrations from operation of the standby generators are provided in Table 6-4. The estimates are based on emission factors obtained from EPA publication AP-42 and concentrations predicted by the ISCST3 model.

In addition to calculation of annual average concentrations, initial modeling of emissions from the standby generators were also calculated for 1-hour and 24-hour averaging periods. This was done to facilitate determination of short-term toxic pollutant concentrations for comparison to the Florida ARCs. Maximum 8-hour average concentrations were calculated by adjusting the maximum 1-hour model-predicted concentration by a factor of 0.7. To calculate 24-hour average and annual average concentrations, the model-predicted concentration was directly scaled to the emission rate of each specific pollutant.

Estimated maximum impacts presented in Table 6-4 show that none of the toxic pollutants emitted from the standby generators exceed any of the Florida ARCs. It is concluded that operation of the standby generators does not present any significant threat to offsite receptors.

Table 6-4
Summary of Toxic Pollutant Impacts[1]
EMD 20F4B Standby Generators

	Emission Rate (mg/s)		Maximum Predicted Concentration ($\mu g/m^3$)			Florida Ambient Reference Concentration ($\mu g/m^3$)		
Pollutant	**Max Hourly[2]**	**Annual Average[3]**	**8-Hour Average[4]**	**24-Hour Average[4]**	**Annual Average[5]**	**8-Hour Average**	**24-Hour Average**	**Annual Average**
Benzene	2.622	1.999	6.90	3.94	0.006	30	7	0.12
Toluene	0.949	0.715	2.50	1.43	0.002	1880	448	400
Xylenes	0.652	0.494	1.72	0.981	0.001	4340	1033	80
Formaldehyde	0.267	0.202	0.702	0.401	<0.001	3.7	0.9	0.077
Acetaldehyde	0.085	0.064	0.224	0.128	0.002	450	107	0.5
Acrolein	0.027	0.020	0.070	0.040	<0.001	2.3	0.5	0.02
Naphthalene	0.439	0.333	1.16	0.661	<0.001	50	119	-
Flourene	0.043	0.033	0.114	0.065	<0.001	2.0	0.5	50
Benz(a)anthracene	0.002	0.002	0.006	0.003	4.66e-6	-	-	0.0011
Chrysene	0.005	0.004	0.013	0.008	1.15e-5	2.0	0.5	-
Benzo(a)pyrene	0.001	0.001	0.002	0.001	1.92e-6	-	-	0.0003
Dibenz(a,h)anthracene	0.001	0.001	0.003	0.002	2.59e-6	-	-	0.000071

Notes:
[1] Maximum Unit Risk Factors obtained from model: 1-hour = 3761, annual = 2.93
8-hour Unit Risk Factor = 0.7(1-hour Unit Risk Factor) = 2,633
[2] Max hourly emission rate = (lb pollutant/MMBtu)(26.79 MMBtu/hr-gen)(1 gen)(454 g/lb)(hr/3,600 s)
[3] Max annual average emission rate = (max hourly emission rate)(annual capacity factor) where annual capacity factor = (19,000,000 kW-hr)/((8,760 hr)(2865 kW)) = 0.757
[4] 8-hour average concentration = (max hourly emission rate)(8-hour Unit Risk Factor) 24-hour average concentration = (max hourly emission rate)(24-hour Unit Risk Factor)
[5] Annual average concentration = (annual avg emission rate)(annual Unit Risk Factor)

SECTION 7

Additional Impact Analyses

As required by PSD regulations, this section addresses possible impacts on visibility, vegetation and soils, growth, PSD Class I areas, and nonattainment areas.

7.1 Effects on Visibility in PSD Class I Areas

The Federal Land Managers (FLM) has requested that air emissions associated with the proposed modification be evaluated with respect to visibility impact. The PSD and visibility guidelines of EPA require evaluating a type of visibility impairment known as "plume blight," which can be traced to a single source or small groups of sources. Sources of air pollution can cause visible plumes if emissions of particulate and NO_x are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background. The Plume Visual Impact Screening Model (VISCREEN) was used to perform the plume blight visibility analysis according to methodology in the VISCREEN manual (EPA, 1992). VISCREEN is an EPA-approved screening model for visibility that makes use of conservative (i.e., visibility-protective) assumptions that may not accurately represent site-specific conditions. The VISCREEN output files are included in Appendix D.

7.2 VISCREEN Analysis of Plume Visual Impacts

7.2.1 Model Overview

The objective of plume visual impact screening and analysis is to determine whether a plume is visible as an object itself. VISCREEN makes the determination by calculating the contrast and color difference parameter (Δ E) of the plume against a sky background and against a terrain background. The results are compared to contrast and Δ E perception screening criteria values. For this project, VISCREEN calculated these parameters for emission rates of NO_x and PM-10. Emissions from the standby generators were assumed to create an infinitely long, straight plume whose position was specified by the user.

The visibility analysis involved determination of worst-case, site-specific dispersion conditions using 5 years of sequential, hourly meteorological data. Wind frequency distributions were constructed based on stability class, wind direction, wind speed, and time of day. It was assumed unlikely that steady-state plume conditions could persist for more than 12 hours. Therefore, wind speeds that result in a transport time beyond 12 hours from the source to the observer were not considered. This approach is consistent with EPA's guidance recommendations (EPA, 1992).

7.2.2 Modeling Approach

The VISCREEN model was run to assess the impact of the standby generators on visibility inside and outside of the Everglades National Park.

7.2.3 Input Parameters

Impacts on visibility from the standby generators will be most affected by NO_x and PM-10. The maximum potential emission rates for these pollutants will be 29.0 g/s and 0.7 g/s, respectively. The emission rates are based on the maximum hourly emissions from all four 20F4B generators at the Alexander Orr, Jr. WTP (see emission calculations in Attachment 5 of the Air Permit Application [Appendix A]). No soot or primary sulfate (SO_4) emission increases were estimated from the proposed modification.

VISCREEN requires inputs of emission rates for PM-10 and NO_x, observer distance, minimum and maximum viewing distances from the source to the Class I area boundaries, standard visual ranges, and background ozone concentrations. The observer distance is the distance from the Alexander Orr, Jr. WTP to the Shark Valley Lookout Tower, which is 43 km. Two plume center lines offset by 11.25 degrees on either side of the observer line were drawn to determine the minimum and maximum viewing distances. The minimum viewing distance is the shortest distance from the standby generators to the park boundary along either viewing line. In this case, the minimum viewing distance is 16.75 km. The maximum viewing distance is the longest distance from the standby generators to the farthest park boundary along either viewing line. In this case, the maximum viewing distance is 110.5 km.

The 90th percentile standard visual ranges were obtained from FLM. Standard visual ranges and background ozone concentrations provided for each season were used in the analysis

(Morse, 1997). Default particle size information and plume offset angles (plume-source observer angles) were selected as recommended by the model.

Site-specific meteorological data were used in the VISCREEN modeling analysis. The joint frequency distribution of dispersion conditions, calculated from stability, wind speed, and plume offset angle measured near the emission source, is an important requirement for the plume visual impact analysis. A table was constructed that ranked combinations of stability class and wind speed from worst to best in terms of dispersion condition (see Appendix D).

Five years of meteorological data from MIA (1987–1991) were used to determine relative frequencies of various wind speeds. Stability class/wind speed combinations were determined for all daylight hours when the wind was blowing from the east toward the Everglades Class I area (i.e., from the source to the observer). The worst-case meteorological condition was then selected by determining the frequency of occurrence of each wind speed/stability combination and identifying a condition such that the frequency of worse dispersion conditions totaled 1 percent (cumulative frequency of all dispersion conditions exceeds 1 percent). This means that if the wind seldom blows toward the Class I area, more unstable conditions will need to be considered before 1 percent of the annual winds can be accounted for (this implies lower visual impact potential). At the direction of the National Park Service, only daylight hours, including the hour before sunrise and the hour after sunset, were used for this analysis. Based on this analysis, worst-case meteorological conditions are stability category E with a wind speed of 2 m/s. A summary of the input parameters for the visibility analysis are provided in Table 7-1.

The visual impact inside and outside of an area for observers on the boundaries of an area are characterized by two parameters: Δ E and plume contrast. Δ E is perhaps the most appropriate plume perceptibility parameter because it is based on the human eye-brain system's relative sensitivity to all wavelengths in the visible spectrum. Contrast is the parameter most commonly used in the published literature to describe the overall sensitivity of the human eye-brain system. Contrast is also the most easily calculated plume visibility parameter. EPA recommends default acceptance criteria for Δ E and contrast of 2.00 and $\pm$0.05, respectively. These criteria were used in the model.

Table 7-1
VISCREEN Input Parameters
Alexander Orr, Jr. WTP

Input Parameter	Value
Emission Rate (g/s)	
NO_x	29.00
PM-10	0.70
Mass Median Diameters (μm)	Default
Density (g/cm^3)	Default
Background Ozone (ppm)–Everglades National Park	
Spring	0.061
Summer	0.040
Autumn	0.047
Winter	0.045
Wind Speed (m/s)	2.00
Stability Class	E
Plume Offset Angle (degrees)	11.25
Background Visual Range (km)–Everglades National Park	
Spring	47
Summer	59
Autumn	63
Winter	43

7.2.4 Modeling Results

The VISCREEN results for each season inside and outside the Class I area are summarized in Table 7-2. Maximum visibility impacts are predicted to occur during the autumn months. Autumn Δ E and contrast values of 0.968 and -0.005, respectively, predicted inside the Class I area and autumn Δ E and contrast values of 0.560 and -0.005, respectively, predicted outside the Class I area were all within acceptable criteria. The analysis shows that this project will not cause visibility criteria to be exceeded in Everglades National Park or in any of the surrounding Class II areas.

7.3 Effects on Vegetation and Soils

One indicator of potential vegetation and soils effects is a comparison of predicted ambient concentrations with ambient air quality standards. Of most significance here is that the secondary NAAQS were established to prevent adverse "welfare" effects, such as direct damage to vegetation and harmful contamination of soils. The secondary NAAQS for NO_2 is the same as the primary standard (100 $\mu g/m^3$). Because it has been shown that operation of the standby generators will not result in a threat to any NAAQS, primary or secondary, there should not be any discernible effects on vegetation and soils.

Table 7-2
VISCREEN Results—Everglades National Park
Alexander Orr, Jr. WTP

Season	ΔE	Contrast
Inside Class I Area		
Spring	0.743	-0.003
Summer	0.914	-0.004
Autumn	0.968	-0.005
Winter	0.681	-0.003
Outside Class I Area		
Spring	0.246	-0.002
Summer	0.476	-0.005
Autumn	0.560	-0.005
Winter	0.182	-0.002

[a] Indicates plume impacts that exceed screening criteria

Vegetation and soils are also affected by acid deposition. Acid deposition is caused by the conversion of SO_2 and NO_2 in exhaust gases to sulfuric and nitric acids (H_2SO_4 and HNO_3, respectively) in the presence of water in the air. The acids are the deposited onto vegetation and soils by fog, rain, or snow (snow is an extremely rare occurrence in the Everglades). The maximum ambient concentration of NO_2 at any receptor in the Everglades National Park Class I area associated with operation of the standby generators, as predicted in the screening analysis, was used to calculate HNO_3 deposition in the Class I area. The calculation was performed assuming all NO_x emissions were converted to HNO_3.

Calculations of acid deposition within the Everglades Class I Area are summarized in Table 7-3. These acid deposition rates have been calculated according to the method provided in the *Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I Report: Interim Recommendation for Modeling Long Range Transport Impacts on Regional Visibility, April 1993.* The maximum NO_x concentration at any receptor in the Everglades Class I Area associated with sources at the Alexander Orr, Jr. WTP, as predicted by the ISC3 model, is 0.70 $\mu g/m^3$. The standby generators account for 0.51 $\mu g/m^3$ at this receptor. The resulting HNO_3 deposition rates are 0.96 $\mu g/m^3$ and 0.70 $\mu g/m^3$ for the plant and generators, respectively. Conversion of units gives HNO_3 deposition rates of 106.3 kg/hectare-year (plant) and 76.8 kg/hectare-year (generators).

Table 7-3
Acid Deposition in the Everglades National Park Class I Area
Alexander Orr, Jr. WTP

Source	Highest Predicted Conc. ($\mu g/m^3$)		Accumulation Rate ($\mu g\text{-}s/m^3\text{-}yr$)[3]	HNO_3 Deposition Rate[4]	
	NO_x[1]	HNO_3[2]		($\mu g/m^2$-yr)	(kg/hectare-yr)
20F4B Generators	0.508	0.696	2.19E+07	1.10E+06	76.8
Entire Plant	0.703	0.963	3.04E+07	1.52E+06	106.3

[1] Predicted by ISCST3 model for year 1990 to occur on the eastern park boundary.
[2] Assumes complete conversion of NO_x to HNO_3.
[3] Obtained by multiplying the annual average HNO_3 concentration by 3.1536E+7 seconds/yr.
[4] Obtained by multiplying the accumulation rate by the deposition velocity of HNO_3, which is 0.05 m/s.

7.4 Effects on Associated Growth

While the need to operate the standby generators and to maintain power generation capacity is dictated by the size of the plant and its associated power demand, the standby generators will not have any direct or indirect impact on the capacity of the plant to produce water. Because it is the capacity of the plant to produce water that is linked to growth, the standby generators will not have any significant impact on growth in the area. In addition, employment at the Alexander Orr, Jr. WTP for the purpose of maintaining the standby generators is not expected to increase. Therefore, no significant impact on local air quality conditions is expected.

7.5 Impacts on Nonattainment Areas

There are no nonattainment areas for any pollutant in Florida, nor are there any nonattainment areas within 200 km of the Alexander Orr, Jr. WTP. Miami-Dade County is classified as an attainment area for ozone. The facility is not expected to impact any nonattainment areas based on the air quality impact analysis performed.

SECTION 8

References

Florida Air Toxics Working List. Florida Department of Environmental Protection.

U.S. Environmental Protection Agency. Industrial Source Complex Model, Version 96113. Office of Air Quality Planning and Standards. Available from EPA TTN Electronic Bulletin Board System (919) 541-5742. 1996.

Multi-Tiered Screening Approach for Estimating Annual NO_2 Concentrations from Point Sources, Federal Register, Vol. 60, No. 153, p. 40469. August 9, 1995.

U.S Environmental Protection Agency. Interagency Workgroup On Air Quality Modeling (IWAQM) Phase I Report: Interim Recommendations for Modeling Long Range Transport and Impacts on Regional Visibility. EPA-454/R-93-015. April 1993.

APPENDIX A

Application for Air Permit--DEP Form 62-210.900(1)

Department of
Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Identification of Facility Addressed in This Application

1. Facility Owner/Company Name : Miami-Dade Water & Sewer Dept.		
2. Site Name : Alexander Orr, Jr. WTP		
3. Facility Identification Number : 50WPB13		[ ] Unknown
4. Facility Location : Alexander Orr, Jr. Water Treatment Plant Miami-Dade Water & Sewer Dept. Street Address or Other Locator : 6800 S.W. 87th Avenue City : Miami	County : Miami-Dade	Zip Code : 33133 0316
5. Relocatable Facility? [ ] Yes [X] No		6. Existing Permitted Facility? [X] Yes [ ] No

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official :	
Name :	Robert C. Ready, P.E.
Title :	Asst. Director, Treatment Facilities
2. Owner or Authorized Representative or Responsible Official Mailing Address :	
Organization/Firm :	Miami-Dade Water & Sewer Dept.
Street Address :	4200 Salzedo Street
City :	Coral Gables
State :	FL Zip Code : 33146-0316
3. Owner/Authorized Representative or Responsible Official Telephone Numbers :	
Telephone :	(305)669-7668 Fax : (305)669-3753

4. Owner/Authorized Representative or Responsible Official Statement :

I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions units.*

R C Ready   4-22-98

Signature   Date

* Attach letter of authorization if not currently on file.

Scope of Application

Emissions Unit ID	Description of Emissions Unit	Permit Type
001-004	Pump Engine Nos. 1, 3, & 4 (Diesel)	AC1E
005	Pump Engine No. 5 (Diesel)	AC1C
006	Pump Engine No. 6 (Dual Fuel)	AC1C
009-012	4 Generator Sets (20F4B)	AC1A

Purpose of Application and Category

Category I : All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain :

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number :

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed :

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number :

Operation permit to be revised :

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application.

Operation permit to be revised/corrected :

[ ] Air operation permit revision for a Title V source for reasons other than construction or

modification of an emissions unit.

Operation permit to be revised :

Reason for revision :

Category II : All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain :

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s) :

[ ] Renewal air operation permit under Fule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed :

[ ] Air operation permit revision for a synthetic non-Title V source.

Operation permit to be revised :

Reason for revision :

Category III : All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain :

[ ] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any :

[X] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s) :
AO13-177245

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one :

[X] Attached - Amount : $13000.00 [ ] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations : Construction permits are requested for 3 existing permitted 825 bhp diesel engine-driven pumps, 1 existing permitted 1500 bhp diesel engine-driven pump, 1 existing permitted 2115 bhp dual fuel engine-driven pump, and 4 existing unpermitted generator sets. All 3 825 bhp engines are proposed in this application as a single, collectively regulated emissions unit. All 4 generator sets are proposed in this application as a single, collectively regulated emissions unit. The 1500 bhp and 2115 bhp engines are proposed in this application as a single, collectively regulated emissions unit. The engine-driven pumps are covered under FDEP operating permit no AO13-177245. This application for construction permit is to establish enforceable emissions limitations to minimize impact on ambient air quality. No actual increase or decrease in emissions is anticipated to result from issuance of this permit. The Miami-Dade Water & Sewer Dept request a construction permit to allow increased operation of these generator sets. This project will result in a new major source of emissions.
2. Projected or Actual Date of Commencement of Construction : 01-May-1998
3. Projected Date of Completion of Construction : 01-Jul-1998

Professional Engineer Certification

1. Professional Engineer Name : David E. Lindberg, P.E. Registration Number : 50036
2. Professional Engineer Mailing Address : Organization/Firm : CH2M HILL Street Address : 800 Fairway Drive, Suite 350 City : Deerfield Beach State : FL Zip Code : 33441-1831
3. Professional Engineer Telephone Numbers : Telephone : (954)426-4008 Fax : (954)698-6010

4. Professional Engineer Statement :

I, the undersigned, hereby certified, except as particularly noted herein, that :*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollutant control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [✓] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

David Lindberg | 24 March 1998

Signature | Date

* Attach any exception to certification statement.

I. Part 6 - 1

DEP Form No. 62-210.900(1) - Form
Effective : 3-21-96

DAVID E. LINDBERG
CERTIFICATE
NO. 50036
STATE OF
FLORIDA
PROFESSIONAL ENGINEER
3/24/98

Application Contact

1. Name and Title of Application Contact : Name : Bertha Goldenberg, P.E. Title : Environmental Coordinator	
2. Application Contact Mailing Address : Organization/Firm : Miami-Dade Water & Sewer Dept. Street Address : 4200 Salzedo Street City : Coral Gables State : FL Zip Code : 33146-0316	
3. Application Contact Telephone Numbers : Telephone : (305)669-5711 Fax : (305)669-5717	

Application Comment

The purpose of this application is to obtain construction permits for 5 engine-driven pumps and 4 generator sets.

The application fee of $13000 submitted for this application consists of $7500 for the generator sets (403 tpy NOx emissions - PSD review), $4500 for engine-driven pump nos. 5 & 6 (79.8 tpy NOx emissions), and $1,000 for engine-driven pump nos. 1, 3, & 4 (24.5 tpy NOx emissions). A single emissions limit is requested for pump engine nos. 5 & 6. The Miami-Dade Water & Sewer Dept. requests that one application fee of $4500 be applied to both engines.

The total emissions increase associated with this project is greater than 250 tons per year NOx. Information included in these construction permit applications should be assimilated into the Title V operating permit application submitted to the Department.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility, Location, and Type

1. Facility UTM Coordinates : Zone : 17 East (km) : 566.60 North (km) : 2843.50			
2. Facility Latitude/Longitude : Latitude (DD/MM/SS) : 25 42 30 Longitude (DD/MM/SS) : 80 20 10			
3. Governmental Facility Code : 3	4. Facility Status Code : A	5. Facility Major Group SIC Code : 49	6. Facility SIC(s) : 4941
7. Facility Comment : The facility is a water treatment plant.			

Facility Contact

1. Name and Title of Facility Contact : Tom Segars, Superintendent of Water Production	
2. Facility Contact Mailing Address : Organization/Firm : Miami-Dade Water & Sewer Dept. Street Address : 700 W. Second Ave. City : Hialeah	State : FL Zip Code : 33010-0006
3. Facility Contact Telephone Numbers : Telephone : (305)888-2522	Fax : (305)889-0156

Facility Regulatory Classifications

1. Small Business Stationary Source?	N
2. Title V Source?	Y
3. Synthetic Non-Title V Source?	N
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	Y
5. Synthetic Minor Source of Pollutants Other than HAPs?	N
6. Major Source of Hazardous Air Pollutants (HAPs)?	N
7. Synthetic Minor Source of HAPs?	N
8. One or More Emissions Units Subject to NSPS?	N
9. One or More Emission Units Subject to NESHAP?	N
10. Title V Source by EPA Designation?	N
11. Facility Regulatory Classifications Comment :	

B. FACILITY REGULATIONS

Rule Applicability Analysis

The Alexander Orr, Jr. WTP is a major source of air pollution and is required to obtain a Title V operating permit (Chapter 62-213, FAC). An application has been submitted to the Department. Current actual emissions are below major PSD source levels. This application requests a permit to construct a new major source, and a permit to modify an existing minor source. General Preconstruction Review applies to the minor modification (Chapter 62-212.300, FAC) and PSD Preconstruction Reveiw applies to the major new source (Chapter 62-212.400, FAC).

B. FACILITY REGULATIONS

List of Applicable Regulations

Chapter 62-204.240, FAC: Ambient Air Quality Standards

62-296.320, FAC: General Pollutant Emissions Limiting Standards

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
PM	B
NOX	A
CO	A

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 4

1. Pollutant Emitted : PM		
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment : No emissions cap is requested for PM.		

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 1

1. Pollutant Emitted : NOX		
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment : No emissions cap is requested for NOx.		

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Information Pollutant 2

1. Pollutant Emitted : CO		
2. Requested Emissions Cap :	(lbs/hour)	(tons/year)
3. Basis for Emissions Cap Code :		
4. Facility Pollutant Comment : No emissions cap is requested for CO.		

D. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location :	Attachment 1
2. Facility Plot Plan :	Attachment 2
3. Process Flow Diagram(s) :	NA
4. Precautions to Prevent Emissions of Unconfined Particulate Matter :	NA
5. Fugitive Emissions Identification :	NA
6. Supplemental Information for Construction Permit Application :	Attachment 3

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities :	NA
8. List of Equipment/Activities Regulated under Title VI :	NA
9. Alternative Methods of Operation :	NA
10. Alternative Modes of Operation (Emissions Trading) :	NA
11. Identification of Additional Applicable Requirements :	NA
12. Compliance Assurance Monitoring Plan :	NA
13. Risk Management Plan Verification :	NA
14. Compliance Report and Plan :	NA
15. Compliance Certification (Hard-copy Required) :	NA

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

   [X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

   [X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

<u>Type of Emissions Unit Addressed in This Section</u>

1. Regulated or Unregulated Emissions Unit? Check one :

   [X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

   [X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

III. EMISSIONS UNIT INFORMATION

A. TYPE OF EMISSIONS UNIT
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one :

[X] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one :

[X] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

Emissions Unit Information Section 1

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Pump Engine Nos. 1, 3, & 4 (Diesel)		
2. Emissions Unit Identification Number : 001-004 [ ] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code : A	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment : Pump engine no. 2 has been permanently removed from service. Pump engine nos. 1, 3, & 4 each drive a 15 mgd pump.		

Emissions Unit Information Section 2

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Pump Engine No. 5 (Diesel)		
2. Emissions Unit Identification Number : 005 [ ] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code : A	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment : Pump engine no. 5 drives a 40 mgd pump.		

Emissions Unit Information Section 3

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : Pump Engine No. 6 (Dual Fuel)		
2. Emissions Unit Identification Number : 006 [ ] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code : A	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment : Pump engine no. 6 drives a 50 mgd pump.		

Emissions Unit Information Section 4

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section : 4 Generator Sets (20F4B)		
2. Emissions Unit Identification Number : [X] No Corresponding ID [ ] Unknown		
3. Emissions Unit Status Code : C	4. Acid Rain Unit? [ ] Yes [X] No	5. Emissions Unit Major Group SIC Code : 49
6. Emissions Unit Comment : Emission unit consists of four 4,000 hp diesel fueled and turbocharged internal combustion engine prime movers, each coupled to a 2,865 kW electrical generator.		

Emissions Unit Information Section 4
4 Generator Sets (20F4B)

Emissions Unit Control Equipment 1

1. Description : BACT for NOx emissions from diesel engines is fuel injection timing retard (IR) + turbocharger aftercoolers.	
2. Control Device or Method Code :	99

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Emissions Unit Details

1. Initial Startup Date : 01-Aug-1951	
2. Long-term Reserve Shutdown Date :	
3. Package Unit : Manufacturer : Worthington	Model Number : VO-3242
4. Generator Nameplate Rating : MW	
5. Incinerator Information : Dwell Temperature : Dwell Time : Incinerator Afterburner Temperature :	 Degrees Fahrenheit Seconds Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate : 825	bhp	
5. Operating Capacity Comment : Engine rpm and fuel consumption are indicators of operating capacity.		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :	
hours/day	days/week
weeks/year	4,380 hours/year

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

Emissions Unit Details

1. Initial Startup Date :	01-Sep-1956	
2. Long-term Reserve Shutdown Date :		
3. Package Unit : Manufacturer : Worthington		Model Number : VO-3451 (SDR)
4. Generator Nameplate Rating :	MW	
5. Incinerator Information : Dwell Temperature : Dwell Time : Incinerator Afterburner Temperature :		 Degrees Fahrenheit Seconds Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :		mmBtu/hr	
2. Maximum Incinerator Rate :		lb/hr	tons/day
3. Maximum Process or Throughput Rate :			
4. Maximum Production Rate :	1500	bhp	
5. Operating Capacity Comment : Engine rpm and fuel consumption are indicators of operating capacity. Power output limit of 18,520,000 bhp-hr for engine nos. 5 & 6 requested.			

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :		
	hours/day	days/week
	weeks/year	4,866 hours/year

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

Emissions Unit Details

1. Initial Startup Date :	01-May-1961	
2. Long-term Reserve Shutdown Date :		
3. Package Unit : Manufacturer : Enterprise		Model Number : VO-61001
4. Generator Nameplate Rating :	MW	
5. Incinerator Information : Dwell Temperature : Dwell Time : Incinerator Afterburner Temperature :		 Degrees Fahrenheit Seconds Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate : 2113	hp	
5. Operating Capacity Comment : Engine rpm and fuel consumption are indicators of operating capacity. Power output limit of 18,520,000 bhp-hr for engine nos. 5 & 6 requested.		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :	
hours/day	days/week
weeks/year	8,760 hours/year

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Emissions Unit Details

1. Initial Startup Date :	01-May-1998
2. Long-term Reserve Shutdown Date :	
3. Package Unit : Manufacturer : Electro-Motive Division of General Motor	Model Number : 20-645F4B
4. Generator Nameplate Rating : 3 MW	(2.865 MW)
5. Incinerator Information : Dwell Temperature : Dwell Time : Incinerator Afterburner Temperature :	 Degrees Fahrenheit Seconds Degrees Fahrenheit

Emissions Unit Operating Capacity

1. Maximum Heat Input Rate :	mmBtu/hr	
2. Maximum Incinerator Rate :	lb/hr	tons/day
3. Maximum Process or Throughput Rate :		
4. Maximum Production Rate : 2865	KW	
5. Operating Capacity Comment : Generator nameplate rating and maximum production rate listed above are for a single generator set.		

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule :	
hours/day	days/week
weeks/year	8,760 hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Rule Applicability Analysis

No change in actual emissions is being requested for this emissions unit. Emissions limits are being requested to minimize ambient pollutant concentrations predicted by the air quality impact analysis performed for the 20F4B generator sets. General Preconstruction Review (Chapter 62-212.300, FAC) applies to the application for this emissions unit.

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Emissions Unit Information Section 2
Pump Engine No. 5 (Diesel)

Rule Applicability Analysis

No change in actual emissions is being requested for this emissions unit. Emissions limits are being requested to minimize ambient pollutant concentrations predicted by the air quality impact analysis performed for the 20F4B generator sets. General Preconstruction Review (Chapter 62-212.300, FAC) applies to the application for this emissions unit.

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

Rule Applicability Analysis

No change in actual emissions is being requested for this emissions unit. Emissions limits are being requested to minimize ambient pollutant concentrations predicted by the air quality impact analysis performed for the 20F4B generator sets. General Preconstruction Review (Chapter 62-212.300, FAC) applies to the application for this emissions unit.

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Rule Applicability Analysis

The increase in emissions of NOx associated with proposed operation of the standby generators constitues a major source. Therefore, this project is subject to the requirements of PSD review, as stated in Chapter 62-212.400, FAC.

Emissions Unit Information Section _______

List of Applicable Regulations

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram : #1CC, #3CC, #4CC		
2. Emission Point Type Code : 3		
3. Descriptions of Emission Points Comprising this Emissions Unit : CC Engine No. 1 (south end): vertical stack outside building with silencer.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	31	feet
7. Exit Diameter :	0.67	feet
8. Exit Temperature :	735	°F
9. Actual Volumetric Flow Rate :	1,392	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.598 North (km) : 2,843.531		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	#1CC, #3CC, #4CC	
2. Emission Point Type Code :	3	
3. Descriptions of Emission Points Comprising this Emissions Unit : CC Engine No. 3 (2nd from south end): vertical stack outside building with silencer.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	31	feet
7. Exit Diameter :	0.67	feet
8. Exit Temperature :	735	°F
9. Actual Volumetric Flow Rate :	1,392	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.598 North (km) : 2,843.531		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	#1CC, #3CC, #4CC	
2. Emission Point Type Code :	3	
3. Descriptions of Emission Points Comprising this Emissions Unit : CC Engine No. 4 (3rd from south end): vertical stack outside building with silencer.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	31	feet
7. Exit Diameter :	0.67	feet
8. Exit Temperature :	735	°F
9. Actual Volumetric Flow Rate :	1,392	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.598 North (km) : 2,843.531		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	#5SDR	
2. Emission Point Type Code :	1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking : (limit to 100 characters per point) SDR #5 (2nd from north end): vertical stack located outside the building with silencer.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	31	feet
7. Exit Diameter :	0.8	feet
8. Exit Temperature :	735	°F
9. Actual Volumetric Flow Rate :	3712	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.598 North (km) : 2843.550		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram : #6 Enterprise		
2. Emission Point Type Code : 1		
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking : (limit to 100 characters per point) Enterprise #6 (north end): vertical stack with silencer outside of the building.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	31	feet
7. Exit Diameter :	1.0	feet
8. Exit Temperature :	735	°F
9. Actual Volumetric Flow Rate :	1392	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.598 North (km) : 2843.570		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	Gen #1 - Gen #4	
2. Emission Point Type Code :	3	
3. Descriptions of Emission Points Comprising this Emissions Unit : Generator No. 1 (east end): vertical stack located on top of the enclosure structure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	29	feet
7. Exit Diameter :	1.75	feet
8. Exit Temperature :	635	°F
9. Actual Volumetric Flow Rate :	21,350	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.509 North (km) : 2,843.411		
14. Emission Point Comment :		

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	Gen #1 - Gen #4	
2. Emission Point Type Code :	3	
3. Descriptions of Emission Points Comprising this Emissions Unit : Generator No. 2 (2nd from east end): vertical stack located on top of the enclosure structure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	29	feet
7. Exit Diameter :	1.75	feet
8. Exit Temperature :	635	°F
9. Actual Volumetric Flow Rate :	21,350	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.509 North (km) : 2,843.411		
14. Emission Point Comment :		

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Effective : 3-21-96

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram : Gen #1 - Gen #4	
2. Emission Point Type Code : 3	
3. Descriptions of Emission Points Comprising this Emissions Unit : Generator No. 3 (3rd from east end): vertical stack located on top of the enclosure structure.	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :	
5. Discharge Type Code :	V
6. Stack Height :	29 feet
7. Exit Diameter :	1.75 feet
8. Exit Temperature :	635 °F
9. Actual Volumetric Flow Rate :	21,350 acfm
10. Percent Water Vapor :	%
11. Maximum Dry Standard Flow Rate :	dscfm
12. Nonstack Emission Point Height :	feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.509 North (km) : 2,843.411	
14. Emission Point Comment :	

E. EMISSION POINT (STACK/VENT) INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Emission Point Description and Type :

1. Identification of Point on Plot Plan or Flow Diagram :	Gen #1 - Gen #4	
2. Emission Point Type Code :	3	
3. Descriptions of Emission Points Comprising this Emissions Unit : Generator No. 4 (west end): vertical stack located on top of the enclosure structure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common :		
5. Discharge Type Code :	V	
6. Stack Height :	29	feet
7. Exit Diameter :	1.75	feet
8. Exit Temperature :	635	°F
9. Actual Volumetric Flow Rate :	21,350	acfm
10. Percent Water Vapor :		%
11. Maximum Dry Standard Flow Rate :		dscfm
12. Nonstack Emission Point Height :		feet
13. Emission Point UTM Coordinates : Zone : 17 East (km) : 566.509 North (km) : 2,843.411		
14. Emission Point Comment :		

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Diesel-fueled internal combustion engines (emissions related to thousand gallons burned)	
2. Source Classification Code (SCC) : 2-02-004-01	
3. SCC Units : Thousand Gallons Burned (all liquid fuels)	
4. Maximum Hourly Rate : 0.03	5. Maximum Annual Rate : 131.40
6. Estimated Annual Activity Factor : 0.17	
7. Maximum Percent Sulfur : 0.05	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 132	
10. Segment Comment : Each unit consumes approximately 30 gal/hr diesel fuel at full capacity.	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Diesel-fueled internal combustion engines (emissions related to thousand gallons burned)	
2. Source Classification Code (SCC) : 2-02-004-01	
3. SCC Units : Thousand Gallons Burned (all liquid fuels)	
4. Maximum Hourly Rate : 0.08	5. Maximum Annual Rate : 657.00
6. Estimated Annual Activity Factor : 0.10	
7. Maximum Percent Sulfur : 0.05	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 132	
10. Segment Comment : Pump Engine No. 5 consumes approximately 75 gallons/hr diesel fuel at full capacity and serves as a backup to Pump Engine No. 6.	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

Segment Description and Rate : Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Dual fuel internal combustion engines (emissions related to million cubic feet burned)	
2. Source Classification Code (SCC) : 2-02-002-01	
3. SCC Units : Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate : 0.01	5. Maximum Annual Rate : 122.60
6. Estimated Annual Activity Factor : 0.90	
7. Maximum Percent Sulfur : 0.05	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 1,050	
10. Segment Comment : Pump Engine No. 6 consumes 14,000 scf/hr natural gas and 15 gal/hr diesel fuel at full capacity	

F. SEGMENT (PROCESS/FUEL) INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

<u>Segment Description and Rate :</u> Segment 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) : Diesel fueled internal combustion engines (emissions related to thousand gallons burned or kilowatt-hours power output)	
2. Source Classification Code (SCC) : 2-02-004-01	
3. SCC Units : Thousand Gallons Burned (all liquid fuels)	
4. Maximum Hourly Rate : 0.20	5. Maximum Annual Rate : 2,770.00
6. Estimated Annual Activity Factor : 0.50	
7. Maximum Percent Sulfur : 0.05	8. Maximum Percent Ash :
9. Million Btu per SCC Unit : 132	
10. Segment Comment : Maximum hourly and annual fuel rates are based on a brake-specific fuel consumption (BSFC) of 0.346 lb/bhp-hr diesel fuel (density = 7.0 lb/gal) and 3500 hours per year operation, each. Total fuel consumption by all generators is 2,770,000 gallons (14,000 hours at full load).	

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 1
Pump Engine Nos. 1, 3, & 4 (Diesel)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - NOX			EL
2 - CO			NS

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 2
Pump Engine No. 5 (Diesel)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - NOX			EL
2 - CO			NS

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 3
Pump Engine No. 6 (Dual Fuel)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - NOX			EL
2 - CO			NS

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
1 - CO			NS
2 - NOX			EL
3 - SO2			WP
4 - PM10			WP
5 - VOC			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 2
Pump Engine No. 5 (Diesel)

Pollutant Potential/Estimated Emissions : Pollutant 1

1. Pollutant Emitted : **NOX**
2. Total Percent Efficiency of Control : %
3. Potential Emissions : 36.00 lb/hour 79.80 tons/year
4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive/Other Emissions: to tons/year
6. Emissions Factor : Reference : AP-42, Table 3.4-1
7. Emissions Method Code :
8. Calculations of Emissions : (36 lb/hr NOx)(4433 hr/yr)(ton/2,000 lb) = 79.8 tpy
9. Pollutant Potential/Estimated Emissions Comment : Potential emissions are based on burning diesel fuel only.

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 3
Pump Engine No. 6 (Dual Fuel)

Pollutant Potential/Estimated Emissions : Pollutant 1

1. Pollutant Emitted : **NOX**				
2. Total Percent Efficiency of Control :		%		
3. Potential Emissions :	18.20	lb/hour	79.80	tons/year
4. Synthetically Limited? [X] Yes [ ] No				
5. Range of Estimated Fugitive/Other Emissions:			to	tons/year
6. Emissions Factor : Reference : Historical Tests				
7. Emissions Method Code : 1				
8. Calculations of Emissions : Based on source test results: 18.2 lb/hr NOx (18.2 lb/hr NOx)(8,760 hr/yr)(ton/2,000 lb) = 79.8 tpy				
9. Pollutant Potential/Estimated Emissions Comment :				

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Pollutant Potential/Estimated Emissions : Pollutant 2

1. Pollutant Emitted : **NOX**				
2. Total Percent Efficiency of Control :	28.00 %			
3. Potential Emissions :	57.60	lb/hour	403.00	tons/year
4. Synthetically Limited? [X] Yes [ ] No				
5. Range of Estimated Fugitive/Other Emissions:		to		tons/year
6. Emissions Factor : Reference : Historical Tests				
7. Emissions Method Code : 1				
8. Calculations of Emissions : lb/hr = (80 lb/hr uncontrolled)(0.72) = 57.6 lb/hr BACT tons/year = (57.6 lb/hr)(14000 hrs/year)(ton/2,000 lb) = 403 tons/year				
9. Pollutant Potential/Estimated Emissions Comment : Power output = (14000 hrs/yr)(2865 kW) = 40,110,000 kW-hrs/yr.				

Emissions Unit Information Section 2
Pump Engine No. 5 (Diesel)

Pollutant Information Section 1

Allowable Emissions 1

1. Basis for Allowable Emissions Code : AMBIENT	
2. Future Effective Date of Allowable Emissions :	
3. Requested Allowable Emissions and Units : 36.00 lb/hr	
4. Equivalent Allowable Emissions : 36.00 lb/hour 79.80 tons/year	
5. Method of Compliance : Annual stack testing for NOx-EPA Method 7 (or equivalent)	
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) : Limit proposed to reduce ambient concentration at fenceline. Highest predicted offsite ambient concentration is 99.5 μg/cu.m (including background).	

Emissions Unit Information Section 3
Pump Engine No. 6 (Dual Fuel)

Pollutant Information Section 1

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	RULE			
2. Future Effective Date of Allowable Emissions :				
3. Requested Allowable Emissions and Units :	18.20	lb/hr		
4. Equivalent Allowable Emissions :	18.20	lb/hour	79.80	tons/year
5. Method of Compliance : Annual stack testing for NOx-EPA Method 7 (or equivalent)				
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) : Limit power output from engine nos 5 & 6 to 18,520,000 bhp-hr. Proposed to reduce ambient concentration at fenceline. Highest predicted offsite ambient concentration is 99.5 µg/cu.m (including background).				

Emissions Unit Information Section 4
4 Generator Sets (20F4B)

Pollutant Information Section 2

Allowable Emissions 1

1. Basis for Allowable Emissions Code :	AMBIENT			
2. Future Effective Date of Allowable Emissions :				
3. Requested Allowable Emissions and Units :	9.13	g/kW-hr		
4. Equivalent Allowable Emissions :	57.60	lb/hour	403.00	tons/year
5. Method of Compliance : Annual stack testing using EPA Method 7 or equivalent.				
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) : Monthly monitoring of total power output (kW-hr) and comparison of 12-month rolling total to annual limit of 40,110,000 kW-hr. Highest offsite PSD increment consumption is 24.1 μg/cu.m.				

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 1
Pump Engine Nos. 1, 3, & 4 (Diesel)

<u>Visible Emissions Limitation :</u> Visible Emissions Limitation 1

1. Visible Emissions Subtype :	VE		
2. Basis for Allowable Opacity :	RULE		
3. Requested Allowable Opacity :			
Normal Conditions :		20	%
Exceptional Conditions :		40	%
Maximum Period of Excess Opacity Allowed :		2	min/hour
4. Method of Compliance : Perform annual VE Compliance monitoring using EPA Method 9.			
5. Visible Emissions Comment :			

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 2
Pump Engine No. 5 (Diesel)

Visible Emissions Limitation : Visible Emissions Limitation 1

1. Visible Emissions Subtype :	VE		
2. Basis for Allowable Opacity :	RULE		
3. Requested Allowable Opacity :			
Normal Conditions :	20	%	
Exceptional Conditions :	40	%	
Maximum Period of Excess Opacity Allowed :	2	min/hour	
4. Method of Compliance : Perform annual VE Compliance monitoring using EPA Method 9.			
5. Visible Emissions Comment :			

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 3
Pump Engine No. 6 (Dual Fuel)

Visible Emissions Limitation : Visible Emissions Limitation 1

1. Visible Emissions Subtype :	VE		
2. Basis for Allowable Opacity :	RULE		
3. Requested Allowable Opacity :			
Normal Conditions :	20	%	
Exceptional Conditions :	40	%	
Maximum Period of Excess Opacity Allowed :	2	min/hour	
4. Method of Compliance :			
Perform annual VE Compliance monitoring using EPA Method 9.			
5. Visible Emissions Comment :			

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section 4
4 Generator Sets (20F4B)

Visible Emissions Limitation : Visible Emissions Limitation 1

1. Visible Emissions Subtype :	20		
2. Basis for Allowable Opacity :	RULE		
3. Requested Allowable Opacity :			
Normal Conditions :		20	%
Exceptional Conditions :		40	%
Maximum Period of Excess Opacity Allowed :		2	min/hour
4. Method of Compliance : Annual opacity monitoring using EPA Method 9			
5. Visible Emissions Comment :			

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Information Section ______

Continuous Monitoring System : Continuous Monitor ______

1. Parameter Code :	2. Pollutant :
3. CMS Requirement :	
4. Monitor Information : Manufacturer : Model Number : Serial Number :	
5. Installation Date :	
6. Performance Specification Test Date :	
7. Continuous Monitor Comment :	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

[X] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :					
PM : C		SO2 : C		NO2 : C	
4. Baseline Emissions :					
PM :	0.0000	lb/hour		0.0000	tons/year
SO2 :	0.0000	lb/hour		0.0000	tons/year
NO2 :				0.0000	tons/year
5. PSD Comment :					
The 20F4B generator sets were installed in 1987 as emergency standby generators and are unpermitted.					

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

[X] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :

PM : C	SO2 : C	NO2 : C

4. Baseline Emissions :

PM :	0.0000 lb/hour	0.0000 tons/year
SO2 :	0.0000 lb/hour	0.0000 tons/year
NO2 :		0.0000 tons/year

5. PSD Comment :

The 20F4B generator sets were installed in 1987 as emergency generators and are unpermitted.

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM : U	SO2 : U	NO2 : U
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

[ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

[X] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] None of the above apply. If so, baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code :		
PM : U	SO2 : U	NO2 : U
4. Baseline Emissions :		
PM :	lb/hour	tons/year
SO2 :	lb/hour	tons/year
NO2 :		tons/year
5. PSD Comment :		

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 1

Pump Engine Nos. 1, 3, & 4 (Diesel)

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Attachment 4
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	Attachment 6
5. Compliance Test Report :	Attachment 7
6. Procedures for Startup and Shutdown :	Attachment 8
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	NA
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :	NA
11. Alterntive Modes of Operation (Emissions Trading) :	NA

12. Identification of Additional Applicable Requirements :	NA
13. Compliance Assurance Monitoring Plan :	NA

14. Acid Rain Application (Hard-copy Required) :

NA	Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
NA	Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
NA	New Unit Exemption (Form No. 62-210.900(1)(a)2.)
NA	Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 2

Pump Engine No. 5 (Diesel)

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Attachment 4
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	Attachment 6
5. Compliance Test Report :	Attachment 7
6. Procedures for Startup and Shutdown :	Attachment 8
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	NA
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :	NA
11. Alterntive Modes of Operation (Emissions Trading) :	NA

12. Identification of Additional Applicable Requirements :	NA
13. Compliance Assurance Monitoring Plan :	NA

14. Acid Rain Application (Hard-copy Required) :

NA	Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
NA	Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
NA	New Unit Exemption (Form No. 62-210.900(1)(a)2.)
NA	Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 3

Pump Engine No. 6 (Dual Fuel)

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Attachment 4
3. Detailed Description of Control Equipment :	NA
4. Description of Stack Sampling Facilities :	Attachment 6
5. Compliance Test Report :	Attachment 7
6. Procedures for Startup and Shutdown :	Attachment 8
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	NA
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :	NA
11. Alterntive Modes of Operation (Emissions Trading) :	NA

12. Identification of Additional Applicable Requirements :	NA
13. Compliance Assurance Monitoring Plan :	NA

14. Acid Rain Application (Hard-copy Required) :

NA	Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
NA	Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
NA	New Unit Exemption (Form No. 62-210.900(1)(a)2.)
NA	Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION

Emissions Unit Information Section 4

4 Generator Sets (20F4B)

Supplemental Requirements for All Applications

1. Process Flow Diagram :	NA
2. Fuel Analysis or Specification :	Attachment 4
3. Detailed Description of Control Equipment :	Attachment 5
4. Description of Stack Sampling Facilities :	Attachment 6
5. Compliance Test Report :	Attachment 7
6. Procedures for Startup and Shutdown :	Attachment 8
7. Operation and Maintenance Plan :	NA
8. Supplemental Information for Construction Permit Application :	See Report
9. Other Information Required by Rule or Statue :	NA

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operations :	NA
11. Alterntive Modes of Operation (Emissions Trading) :	NA

12. Identification of Additional Applicable Requirements :	NA
13. Compliance Assurance Monitoring Plan :	NA

14. Acid Rain Application (Hard-copy Required) :

NA	Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
NA	Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
NA	New Unit Exemption (Form No. 62-210.900(1)(a)2.)
NA	Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)

Attachment 1

Area Map (USGS)

South Miami, Florida

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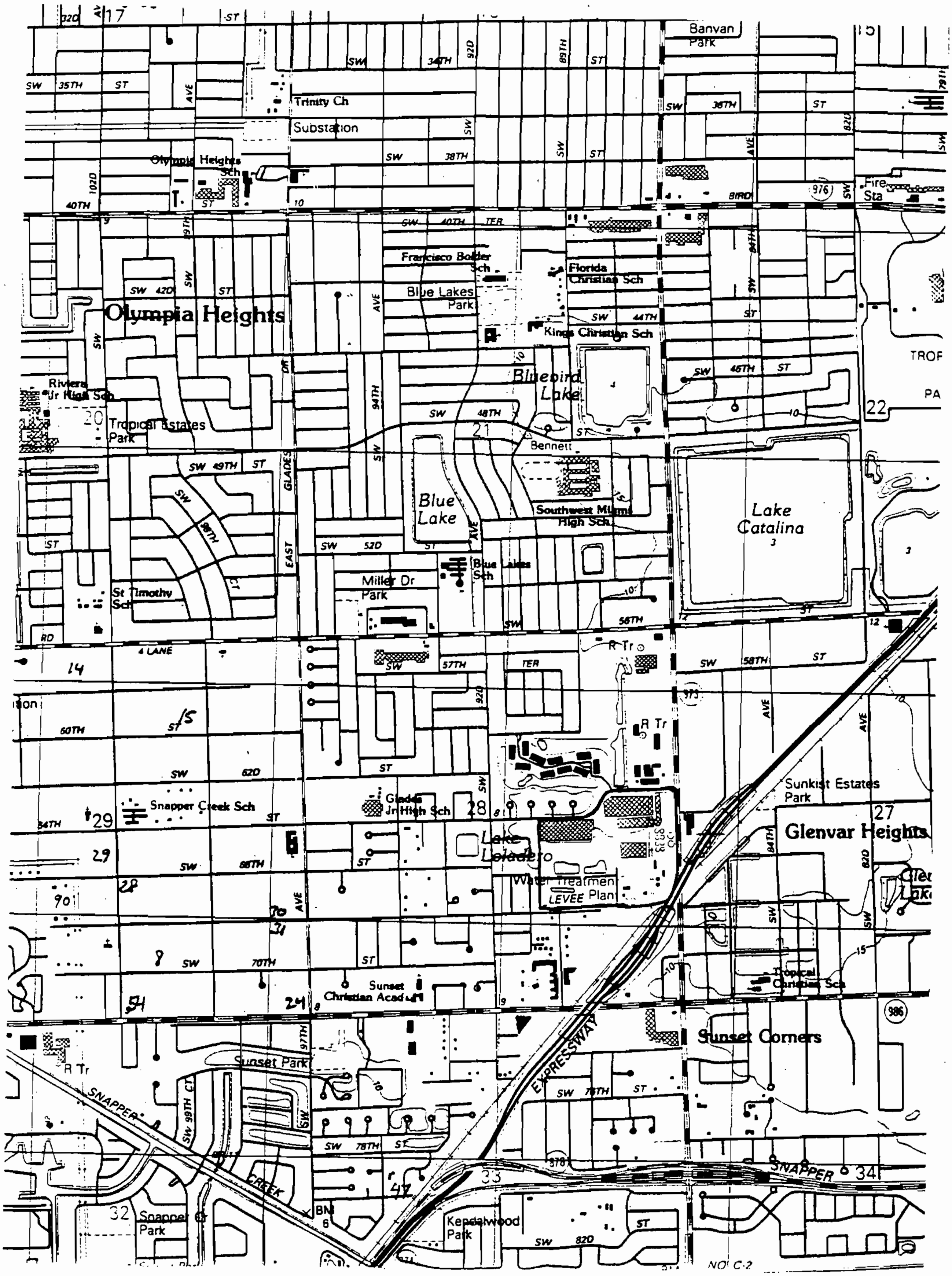

Attachment 2

Site Map

Alexander Orr, Jr. Water Treatment Plant

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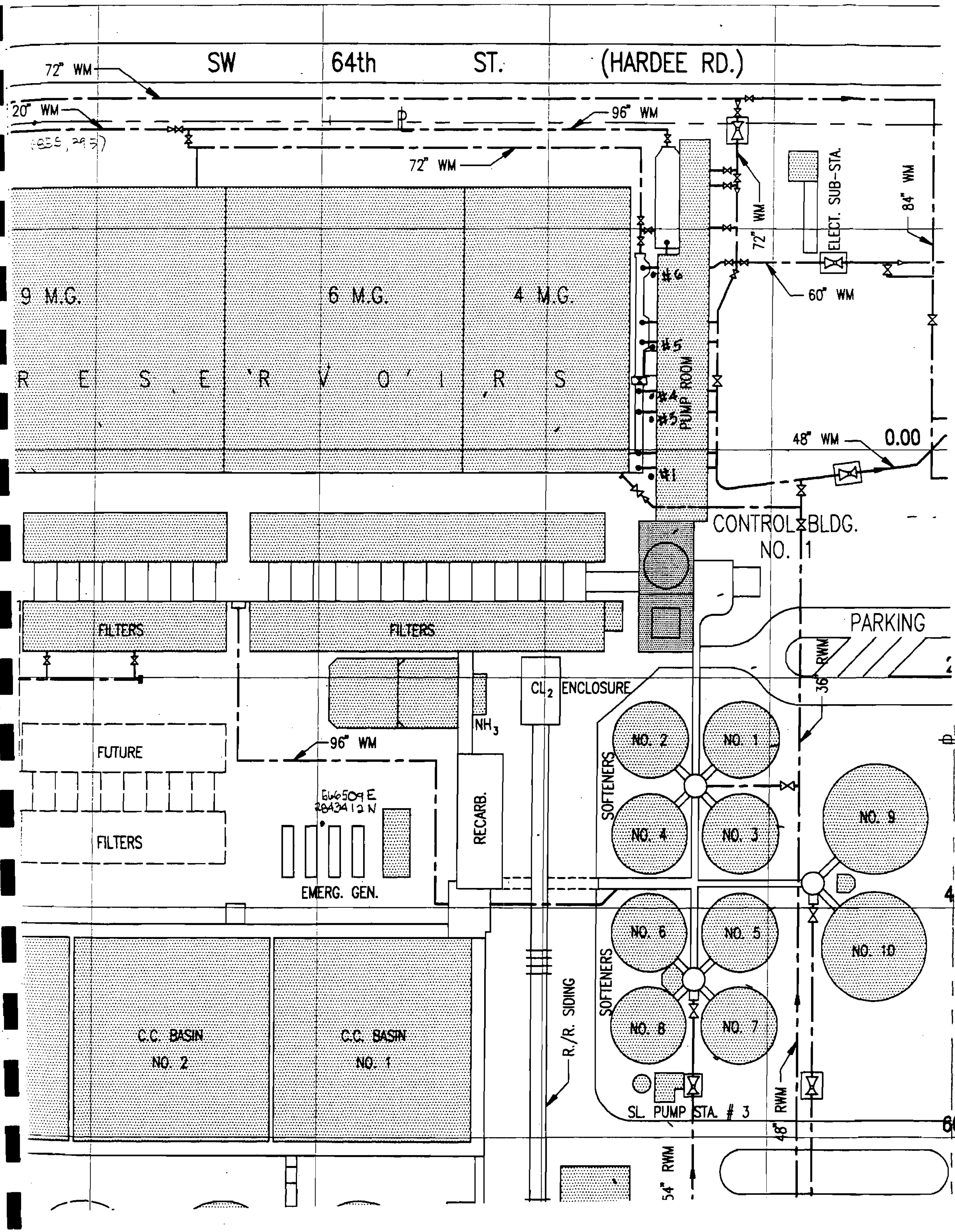

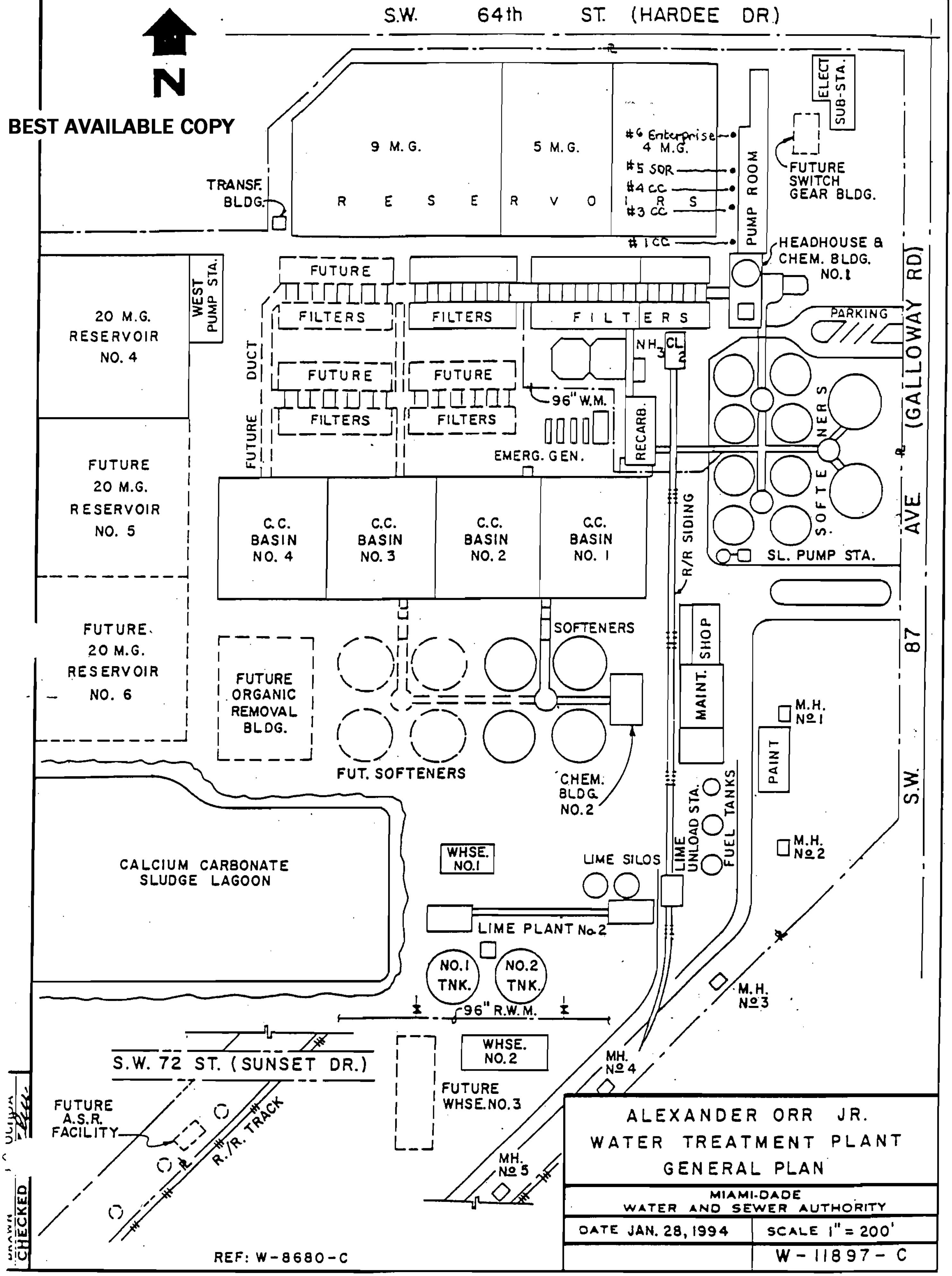
N
S.W. 64th ST. (HARDEE DR.)
9 M.G.
5 M.G.
#6 Enterprise
4 M.G.
#5 SOR
#4 CC
#3 CC
#1 CC
R E S E R V O I R S
PUMP ROOM
ELECT SUB-STA.
FUTURE SWITCH GEAR BLDG.
TRANSF. BLDG.
HEADHOUSE & CHEM. BLDG. NO. 1
20 M.G. RESERVOIR NO. 4
WEST PUMP STA.
FUTURE
FILTERS
FILTERS
F I L T E R S
PARKING
DUCT
FUTURE
FUTURE
FUTURE
FILTERS
FILTERS
NH3
CL2
96" W.M.
RECARB.
EMERG. GEN.
SOFTENERS
SL. PUMP STA.
(GALLOWAY RD)
AVE
87
S.W.
FUTURE 20 M.G. RESERVOIR NO. 5
C.C. BASIN NO. 4
C.C. BASIN NO. 3
C.C. BASIN NO. 2
C.C. BASIN NO. 1
R/R SIDING
FUTURE 20 M.G. RESERVOIR NO. 6
FUTURE ORGANIC REMOVAL BLDG.
SOFTENERS
FUT. SOFTENERS
CHEM. BLDG. NO. 2
SHOP
MAINT.
M.H. No 1
PAINT
LIME UNLOAD STA.
FUEL TANKS
M.H. No 2
CALCIUM CARBONATE SLUDGE LAGOON
WHSE. NO. 1
LIME SILOS
LIME PLANT No. 2
NO. 1 TNK.
NO. 2 TNK.
96" R.W.M.
M.H. No 3
S.W. 72 ST. (SUNSET DR.)
WHSE. NO. 2
MH. No 4
FUTURE WHSE. NO. 3
FUTURE A.S.R. FACILITY
R./R. TRACK
MH. No 5
ALEXANDER ORR JR.
WATER TREATMENT PLANT
GENERAL PLAN
MIAMI-DADE
WATER AND SEWER AUTHORITY
DATE JAN. 28, 1994
SCALE 1" = 200'
W-11897-C
REF: W-8680-C
CHECKED

Attachment 3

Emissions Calculations - NOx Emitting Sources

Alexander Orr, Jr. Water Treatment Plant

Emissions from 20F4B Standby Generators
Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department

Compound	Reference	Units	Controlled Emissions: 25% Load* Factor	lb/hr	tons/yr	50% Load Factor	lb/hr	tons/yr	75% Load Factor	lb/hr	tons/yr	100% Load Factor	lb/hr	tons/yr
CO	Manufacturer's Data[1]	g/hp-hr	0.88	1.94	24.3	0.32	1.41	19.7	0.30	1.98	18.5	0.28	2.47	17.3
NOx	Manufacturer's Data[1]	g/hp-hr	5.46	12.0	151	5.03	22.18	310	5.50	36.3	339	6.54	57.6	403
SO_2	Mass balance[2]	lb/10^3gal	7.10	0.43	5.5	7.10	0.76	10.8	7.10	1.09	10.3	7.10	1.38	9.8
PM_{10}	AP-42, Table 3.4-2[3]	lb/mmbtu	0.05	0.43	5.6	0.05	0.75	11.0	0.05	1.08	10.5	0.05	1.37	10.0
VOCs	AP-42, Table 3.4-3[3]	lb/mmbtu	0.08	0.64	8.4	0.08	1.13	16.5	0.08	1.62	15.7	0.08	2.06	15.0
Benzene	AP-42, Table 3.4-3[3]	lb/mmbtu	7.76E-04	0.01	0.1	7.76E-04	0.01	0.2	7.76E-04	0.02	0.2	7.76E-04	0.02	0.1
Toluene	AP-42, Table 3.4-3[3]	lb/mmbtu	2.81E-04	0.00	0.0	2.81E-04	0.00	0.1	2.81E-04	0.01	0.1	2.81E-04	0.01	0.1
Xylenes	AP-42, Table 3.4-3[3]	lb/mmbtu	1.93E-04	0.00	0.0	1.93E-04	0.0	0.0	1.93E-04	0.00	0.0	1.93E-04	0.01	0.0
Formaldeyde	AP-42, Table 3.4-3[3]	lb/mmbtu	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0
Acetaldehyde	AP-42, Table 3.4-3[3]	lb/mmbtu	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0
Acrolein	AP-42, Table 3.4-3[3]	lb/mmbtu	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0
Propylene	AP-42, Table 3.4-3[3]	lb/mmbtu	2.79E-03	0.02	0.3	2.79E-03	0.04	0.6	2.79E-03	0.06	0.5	2.79E-03	0.08	0.5
Total PAH	AP-42, Table 3.4-4[3]	lb/mmbtu	1.55E-03	0.01	0.2	1.55E-03	0.02	0.3	1.55E-03	0.03	0.3	1.55E-03	0.04	0.3

1 NOx emissions @ 15% O_2 for EMD Model 20-645F4B generator set with BACT applied (fuel injection timing retard + turbocharger/aftercooler). NOx reduction using BACT is 28%.
2 SO_2 emissions are calculated using a mass balance approacb based on a fuel sulfur content of 0.05 wt% (BACT).
3 Emissions for large bore diesel engines assume a diesel fuel density of 7.1 lb/gal and a gross heating value 0f 0.132 mmbtu/gal. PM_{10} reduction using BACT is 7%.
* Maximum potential power output is 25,100,000 kW-hr/hr at 25% load.

Pollutant	BACT	Reduction
NOx	FITR + aftercooler	28%
SO_2	0.05 wt% S fuel content	90%
PM_{10}	Efficient combustion + Low-S fuel	7%

% Load	BSFC (lb/bhp-hr)	gal/hr	Fuel Penalty
100%	0.346	195	0%
75%	0.363	154	5%
50%	0.381	107	10%
25%	0.433	61	25%

20-645F4B

Prime Mover Power Output (bhp):	4,000		
Generator Capacity (kW):	2,865	hours @ full load	
Allowable power output, each (bhp-hr):	56,000,000	14,000	
Allowable power output, each (kW-hr):	40,110,000		

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2 OF 4 B STANDBY GENERATORS

Measured Emissions + safety factor : 80 lb/hr, uncontrolled

Requested Emissions Limitation : 57.6 lb/hr @ full load, BACTed.

$$\left(\frac{57.6\text{ lb}}{\text{hr}}\right)\left(\frac{454\text{ g}}{\text{lb}}\right)\left(\frac{\text{engine}}{4000\text{ bhp}}\right) = \boxed{\frac{6.53\text{ g NOx}}{\text{bhp-hr}}\text{ BACTed}}$$

Annual Average (total)

$$\left(\frac{6.53\text{ g}}{\text{bhp-hr}}\right)\left(\frac{4000\text{ bhp}}{2865\text{ kW}}\right)\left(\frac{40{,}110{,}000\text{ kW-hr}}{\text{yr}}\right)\left(\frac{\text{yr}}{3.153\times10^{7}\text{ s}}\right) = \boxed{\frac{11.6\text{ g}}{\text{s}}\text{ NOx}}$$

Short-Term

$$\left(\frac{6.53\text{ g}}{\text{bhp-hr}}\right)\left(\frac{4000\text{ bhp}}{\text{engine}}\right)\left(\frac{\text{hr}}{3600\text{ s}}\right) = 7.26\text{ g/s each}$$

$$= 29.0\text{ g/s total}$$

PM-10 Emissions (Short-Term)

$$\left(\frac{0.0533\text{ lb}}{\text{MMBTU}}\right)\left(\frac{0.346\text{ lb}}{\text{bhp-hr}}\right)\left(\frac{\text{gal}}{7.1\text{ lb}}\right)\left(\frac{0.132\text{ MMBTU}}{\text{gal}}\right)\left(\frac{454\text{ g}}{\text{lb}}\right)\left(\frac{\text{hr}}{3600\text{ s}}\right)$$

$$= 0.175\text{ g/s each}$$

$$= 0.70\text{ g/s total}$$ → for visibility analysis.

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WORTHINGTON 825 bhp DIESEL ENGINE (PUMP NOS. 1, 3, & 4)

Measured Emissions + safety factor: 11.1 lb/hr NOx

Short-Term Emissions

$$\left(\frac{11.1\ \text{lb}}{\text{hr}}\right)\left(\frac{454\ \text{g}}{\text{lb}}\right)\left(\frac{\text{hr}}{3600\ \text{s}}\right) = \boxed{1.40\ \text{g/s each}}$$

Annual Average Emission Rate Modeled

$$\left(\frac{1.40\ \text{g}}{\text{s}}\right)\left(\frac{4380\ \text{hrs}}{8760\ \text{hrs}}\right) = \boxed{0.70\ \text{g/s total}}$$

WORTHINGTON 1500 bhp DIESEL ENGINE (PUMP No. 5)

Requested Emissions Limit: 36 lb/hr NOx (11.0 g/bhp-hr)

Short-Term Emissions

$$\left(\frac{36\ \text{lb}}{\text{hr}}\right)\left(\frac{454\text{g}}{\text{lb}}\right)\left(\frac{\text{hr}}{3600\text{s}}\right) = \boxed{4.54\ \text{g/s}\ NO_x}$$

Annual Average Emissions

$$\left(\frac{4.54\text{g}}{\text{s}}\right)\left(\frac{4380\ \text{hrs}}{8760\ \text{hrs}}\right) = \boxed{2.27\ \text{g/s}\ NO_x}$$

CH2MHILL SUBJECT EMISSIONS CALCULATIONS
ALEXANDER ORR WTP

BY D. LINDBERG
SHEET 3 OF 3 DATE 2/23/98
PROJECT NO. 139633.AP

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ENTERPRISE 2115 bhp DUAL-FUEL ENGINE (PUMP NO. 6)

Measured Emissions + Safety Factor : 18.2 lb/hr NOx

Short-Term Emissions

$$\left(\frac{18.2\ \text{lb}}{\text{hr}}\right)\left(\frac{454\ \text{g}}{\text{lb}}\right)\left(\frac{\text{hr}}{3600\ \text{s}}\right) = \boxed{2.30\ \text{g/s}\ NO_x}$$

Annual Average Emission Rate Modeled

Total Emissions from 20F4B Standby Generators
Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department

			Controlled Emissions											
			25% Load			50% Load			75% Load			100% Load		
Compound	Reference	Units	Factor	lb/hr	tons/yr	Factor	lb/hr	tons/yr	Factor	lb/hr	tons/yr	Factor	lb/hr	tons/yr
CO	Manufacturer's Data[1]	g/bhp-hr	0.88	1.94	54.9	0.32	1.41	20.0	0.30	1.98	18.7	0.28	2.47	17.5
NOx	1996 Stack Tests	g/bhp-hr	5.46	12.0	340	5.03	22.2	314	5.49	36.3	342	6.54	58	408
SO_2	Mass balance[2]	lb/10^3gal	7.00	0.43	12.2	7.00	0.76	10.8	7.00	1.09	10.3	7.00	1.38	9.8
PM_{10}	AP-42, Table 3.4-2[3]	lb/mmbtu	0.05	0.43	12.6	0.05	0.76	11.1	0.05	1.10	10.6	0.05	1.39	10.1
VOCs	AP-42, Table 3.4-3[3]	lb/mmbtu	0.08	0.65	19.0	0.08	1.15	16.7	0.08	1.64	15.9	0.08	2.18	15.2
Benzene	AP-42, Table 3.4-3[3]	lb/mmbtu	7.76E-04	0.01	0.2	7.76E-04	0.01	0.2	7.76E-04	0.02	0.2	7.76E-04	0.02	0.1
Toluene	AP-42, Table 3.4-3[3]	lb/mmbtu	2.81E-04	0.00	0.1	2.81E-04	0.00	0.1	2.81E-04	0.01	0.1	2.81E-04	0.01	0.1
Xylenes	AP-42, Table 3.4-3[3]	lb/mmbtu	1.93E-04	0.00	0.0	1.93E-04	0.00	0.0	1.93E-04	0.00	0.0	1.93E-04	0.01	0.0
Formaldeyde	AP-42, Table 3.4-3[3]	lb/mmbtu	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0	7.89E-05	0.00	0.0
Acetaldehyde	AP-42, Table 3.4-3[3]	lb/mmbtu	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0	2.52E-05	0.00	0.0
Acrolein	AP-42, Table 3.4-3[3]	lb/mmbtu	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0	7.88E-06	0.00	0.0
Propylene	AP-42, Table 3.4-3[3]	lb/mmbtu	2.79E-03	0.02	0.7	2.79E-03	0.04	0.6	2.79E-03	0.06	0.6	2.79E-03	0.07	0.5
Total PAH	AP-42, Table 3.4-4[3]	lb/mmbtu	1.55E-03	0.01	0.4	1.55E-03	0.02	0.3	1.55E-03	0.03	0.3	1.55E-03	0.04	0.3

1 NOx emissions @ 15% O_2 for EMD Model 20-645F4B generator set with BACT applied (fuel injection timing retard + turbocharger/aftercooler).
NOx reduction using BACT is 28%. Uncontrolled NOx emissions 9.08 g/bhp-hr based on 1996 test results.
2 SO_2 emissions are calculated using a mass balance approach based on a fuel sulfur content of 0.05 wt% (BACT).
3 Emissions for large bore diesel engines assume a diesel fuel density of 7.0 lb/gal and a gross heating value
Of 0.132 mmbtu/gal. PM_{10} reduction using BACT is 7%.
* Maximum potential power output at 25% load is 25,100,000 kW-hr/yr.

Pollutant	BACT	Reduction
NOx	retarded timing + aftercooler	28%
SO_2	0.05 wt% S fuel content	90%
PM_{10}	Eff combustion + Low-S fuel	7%

20-645F4B		
Prime Mover Power Output (hp):	4,000	
Generator Capacity (kW):	2,865	hours @ full load
Allowable power output, each (hp-hr):	56,000,000	14,000
Allowable power output, each (kW-hr):	40,110,000	

% Load	BSFC (lb/bhp-hr)	gal/hr	Fuel Penalty
100%	0.346	198	0%
75%	0.363	156	5%
50%	0.381	109	10%
25%	0.433	62	25%

Attachment 4

Diesel Fuel Purchase Records (Specification)

Alexander Orr, Jr. Water Treatment Plant

DEC-11-96 WED 01:00 PM

BEST AVAILABLE COPY

08/29/96 14:32 ☎305 375 4726 GSA PROCUREMENT

P. 01/01

CC: Booth G
File

MIAMI-DADE WATER AND SEWER DEPARTMENT RECEIVED AUG 2 9 1996 Treatment Facilities

AWARD SHEET
ADDENDUM NO. 1

[illegible] changes effective July 1, 1996:

[illegible]	GASOLINE	LO-SULPHUR CLEAR DIESEL	HI-SULPHUR DYED DIESEL
Federal Excise Tax	EXEMPT	EXEMPT	EXEMPT
State Excise Tax	.04	.04	EXEMPT
State Sales Tax	.085	.085	EXEMPT
Local Option & SCETS	.107	.117	EXEMPT
County Surcharge			
Dade	.06		
Broward	.03		
Palm Beach	.06		
other Counties	EXEMPT	EXEMPT	EXEMPT
Pollution Taxes (state & federal)	.022	.0207	.0207
Minimum Tax to be collected at time of sale	.254	.2627	.0207

1. TO QUALIFY FOR EXEMPTIONS, OR TO PURCHASE NON-TAXABLE DIESEL FUEL. MASS TRANSIT AND STATE AND LOCAL GOVERNMENT USERS MUST BE LICENSED.
2. PURCHASER IS EXEMPT FOR PAYMENT OF FEDERAL EXCISE TAX ON ALL FUEL AT THE TIME OF SALE: IN THE CASE OF TAXABLE FUELS, SELLER MUST FILE FOR A REFUND.
3. ALL STATE AND LOCAL OPTION TAXES ARE COLLECTED ON GASOLINE AND CLEAR TAXABLE LO SULPHUR DIESEL, HOWEVER THE PURCHASER MAY FILE FOR A PARTIAL REFUND.

ALL ELSE REMAINS THE SAME
WILLIAM GARVISO, CPPB

From R.L. Ready Aug 9

To: Greg Lane
Dallas

We must continue to buy low sulfur diesel fuel until we can determine ... requirements

To: Olinda
Co. WASD - Hialeah WTP
Phone # (305) 883-6613
Fax # 889-0156
From: He Hill
019 687 0111

BEST AVAILABLE COPY

CUSTOMER COPY - 2

EMERGENCY NUMBER CHEMTREC 1-800-424-9

Coastal Refining & Marketing, In
A SUBSIDIARY OF THE COASTAL CORPORATION
The Energy People

INSERT FOLLOWING WHEN REQUIRED BY FEDERAL OR STATE LAWS OR REGULATIONS

IT	STATE PERMIT OR LICENSE	VEHICLE LICENSE NO.	STATE MRT FUEL TAX RATE

...to certify that the above-named materials are properly classified, described, packaged, marked ...labeled, and are in proper condition for transportation, according to the applicable regulations of ... Department of Transportation."

...is to also certify that the above-named materials are property, classified, described, packaged, ...rked, and labeled according to the applicable regulations of the Federal Trade Commission and the ...ironmental Protection Agency."

...pper's imprint in lieu of stamp; not a part of Bill of Lading approved by the Interstate Commerce ...mmission.

...ler represents that in the production and manufacture of the goods and/or services covered by this ...oice, it has fully complied with all the provisions of THE FAIR LABOR STANDARDS ACT OF 1938, as ...ended.

...AL NOS.

...NED FOR COASTAL BY — DATE 11-27-96

...CEIVED BY TRUCK DRIVER — DATE

...L SHIPMENTS REQUIRE RAILROAD BILL OF LADING

GOODS RECEIVED:

PURCHASER:

SHIPPER

TRUCK NO. 6112 TRLR NO. 6205

If this shipment moves in other than Shipper's vehicle, it shall be governed by (a) the contract between shipper and c... carrier is a contract carrier or (b) the terms of the applicable uniform bill of lading form prescribed in the current ... Motor Freight Classification, if carrier is a common carrier, provided that, if this is intrastate shipment by common car... state where bills of lading have been legally prescribed, this shipment shall be governed by the terms of applicable lading.

SPECIAL TRUCK MARKINGS, LABELS OR PLACARDS OFFERED/APPLIED AS REQUIRED BY DEPARTMENT OF TRANSPORTATIO...

CARRIER CERTIFIES THAT THE CARGO TANK SUPPLIED FOR THIS SHIPMENT IS A PROPER CONTAINER FOR THE TRANSPORTATION OF THIS COMMODITY

CUSTOMER		TERMINAL	DATE	TIME	CARRIER	BILL OF LADING
IAMI1		PORT EVERGLADES	11-27-96	14:05:33	BOCO	00103463

...est Code 0 Meth Del CU FOB Order

...arrier COASTAL REF & MKTG INC

Card Reference Numbers

Customer	Exchange	Carrier	DR/VI
023312		03547	0130

Charge To:

...eliver To:
MIAMI DADE WATER AND SEWR
PRESTON PLANT
1100 W 2 AVE
PO#S08135B
HIALEAH FL 33010

...d	Description	Unit	Gross	Temp	API	Net
	...ESEL FUEL, 3, NA1993 PGIII					
	...LS DIESEL 0.05%S MAX	GALS	07501.00	078.6	34.9	07436.30

...HIS DIESEL FUEL DOES NOT CONTAIN VISIBLE EVIDENCE OF DYE.

19' — 20 1/4

...SE ADDRESS
...STAL REFINING AND MARKETING, INC. E.P.A. REGISTRATION #4116
...GREENWAY PLAZA HOUSTON, TX 77046

02/28/97 13:04 NO. 207 P04

COASTAL REFINING & MARKETING

BEST AVAILABLE COPY

Coastal
The Energy People

CUSTOMER NO.	INVOICE DATE	INVOICE NO.
MIAMID	12/02/96	D40579

SHIP TO:
MIAMI DADE WATER AND SEWR
PRESTON PLANT
1100 W 2 AVE PO J014288
HIALEAH FL 33010

METHOD OF DELIVERY
COMPANY TRUCK

SOLD TO:

MIAMI DADE WATER SEWER
ATTN: ACCOUNTS PAYABLE
PO BOX 330316
MIAMI FL 33233-0316

REFERENCE NO. 0361-MIAMID-D40579 MIAMI1

TERMS: NET 30 DAYS DOT

BILLING INQUIRIES: CALL CUST SERVICE AT 1-800-(FL) 432-3691, (NAT'L) 327-2495

SALES/P.O. NUMBER: 8081358

TICKET NUMBER	TICKET DATE	LOC CODE	DESCRIPTION	DS ST	QUANTITY	UM	UNIT PRICE	AMOUNT
00103463	112796	PORT	DIESEL - 0.05 S MAX DSLS	FL	7436.30	GAL	~~.791500~~ .7865	~~5885.83~~ 5848.64
			SUBTOTAL		7436.30			~~5885.83~~
			COUNTY ROAD TAX - DIESEL	FL	7436.30	GAL	.117000	870.05
			DIESEL FUEL TAX - UNDYED	FL	7436.30	GAL	.125000	929.54
			COASTAL PROTECTION TAX	FL	7436.30	GAL	.000476	3.54
			WATER QUALITY TAX	FL	7436.30	GAL	.001190	8.85
			INLAND PROTECTION TAX	FL	7436.30	GAL	.019047	141.64

CAR # RECEIVED	DATE	✓
00103463	11/27/96	✓

CHARGE TO ACCOUNT | POSTED
6 494 487 5201 | a
APPROVED BY: [signature] 12/12 1996

DATE 12/5/96
PLEASE CODE AND ACKNOWLEDGE RECEIPT OF GOODS/SERVICES
UG
A/P

FEIN: 84-0429897

CASH DISCOUNT	IF PAID BY	PAY THIS AMOUNT	INVOICE TOTAL
		7,839.45	~~7,839.45~~ 7802.26

IF PAYMENT IS MADE VIA WIRE TRANSFER, PLEASE WIRE FUNDS TO
CITIBANK NA, NY,NY ACCT #4056-8303 ABA #021000089

The buyer agrees to a late payment charge of 1.00 % per month, 12.00 % per annum or the maximum permitted by law from the invoice due date and agrees to pay any collection or attorney fees if incurred in the collection of this invoice.

COMP	CUSTOMER	INVOICE NO
0361	MIAMID	D40579

AMOUNT PAID

PLEASE DETACH AND RETURN THIS PORTION WITH PAYMENT

REMIT TO:
COASTAL REFINING & MARKETING
P.O. BOX 55776, CHARLOTTE, N.C. 28265

0361 MIAMID D40579 000000 000000783945 000000783945

BEST AVAILABLE COPY

Non-Negotiable Bill of Lading

MARATHON OIL COMPANY "Transferor" – 539 S. MAIN ST., FINDLAY, OH – EPA – RFG REG #5045

MATERIAL SAFETY DATA SHEET AVAILABLE FROM THE TERMINAL FOR THESE PRODUCTS ON REQUEST

CUSTOMER NOTICE – THE PRODUCT TRANSFER DOCUMENTS FOR THIS TRANSACTION INCLUDE OTHER DOCUMENTS WHICH MAY CONTAIN ADDITIONAL AND/OR CORRECTING REFORMULATED GASOLINE INFORMATION. IF IN CONFLICT, THE INFORMATION IN THE OTHER DOCUMENTS WILL CONTROL.

Form 50605-A REV. 9/95

SEE REVERSE SIDE FOR HAZARD WARNING INFORMATION & NOTES

DRIVER SIGNATURE:

ALL ITEMS SUBJECT TO CONDITIONS ON REVERSE SIDE HEREOF.

TRUCK SEAL NUMBERS:

SHIPMENT RECEIVED BY:

For Product Emergency
Spill, Leak, Fire, Exposure or Accident, CALL
CHEMTREC - Day or Night 800-424-9300

COPY 6

MARATHON OIL COMPANY "TRANSFEROR" - 539 S. MAIN ST., FINDLAY, OH - EPA-RFG REG #5045
*** CONVENTIONAL GASOLINES - THESE PRODUCTS DO NOT MEET THE REQUIREMENTS FOR REFORMULATED GASOLINES (RFG) AND MAY NOT B
USED IN ANY RFG COVERED AREA. *** SHIPPED FROM: 1601 S.E. 20TH STREET, FT. LAUDERDALE, FL 33316

MARATHON OIL COMPANY
MARATHON OIL COMPANY "TRANSFEROR" - 539 S. MAIN ST., FINDLAY, OH - EPA-RFG REG #5045

DATE	02/25/97
NUMBER	540748-056
TIME IN	9691
TIME OUT	0614

SOLD TO (CONSIGNEE)

[illegible] REFINING & MARKETING EX
[illegible]ELD OIL COMPANY
[illegible] FL

SHIPPED FROM	LOC CODE
FT. LAUDERDALE	0000397449

DATE SHIPPED	SHIPPED VIA
	KILL FREIGHT UNKNOWN
02/25/97	3947 PENN TANK LINES

DESTINATION	CUSTOMER NUMBER	ITEM NUMBER
UNKNOWN FL	913031900000000	

DRIVER	TRAILER	COMPANY	CUSTOMER P.O. AND RELEASE NUMBER	TRANSMITTED CUSTOMER AND RELEASE NUMBER
5130	4115H	0556		
S [illegible]/PENN TK				

CARGO TANK COMPARTMENT PRODUCT DESCRIPTIONS	GROSS GAL.	NET GAL.	TEMP./API GR.	COMMENTS
CONVENTIONAL GASOLINES - THESE PRODUCTS DO NOT MEET THE REQUIREMENTS FOR REFORMULATED				
IN ANY RFG COVERED AREA. *** SHIPPED FROM: 1601 S.E. 20TH STREET, FT. LAUDERDALE, FL 3				
L, 3, NA1993, PG III	5201	5163	075.0/036.2	
. 2 LOW SULFUR FUEL OIL, UNDYED				
.05% MAXIMUM SULFUR, 40 CETANE MINIMUM*				
L, 3, NA1993, PG III	2300	2284	074.5/036.2	
. 2 LOW SULFUR FUEL OIL, UNDYED				
.05% MAXIMUM SULFUR, 40 CETANE MINIMUM*				

PA DETERGENT ADDITIVE REQUIREMENTS

Attachment 5

Description of Control Equipment for Generators

Alexander Orr, Jr. Water Treatment Plant

MKW POWER SYSTEMS, Inc.

AUTHORIZED ELECTRO MOTIVE DISTRIBUTOR

EMD Unit

Information

EMD Model 20-645F4B Diesel Engine

4000 BHP/2865 KW Continuous Rating

Applies to Miami-Dade W&S Authority Dept.
Diesel-Generators at:

Orr WTP (4)
Preston WTP (3 New)

ENGINE DATA

UNIT MODEL	S8E4C		S12F4B		S16F4B		S20F4B	
ENGINE MODEL	8-645E4C		12-645F4B		16-645F4B		20-645F4B	
Rated RPM	750	900	750	900	750	900	750	900
BHP - continuous	1200	1525	2140	2550	2850	3400	3600	4000
KW - continuous	865*	1090*	1530*	1825*	2040*	2435*	2580**	2865*
BMEP - nominal PSI	123	130	146	145	146	145	147	136
Torque @ cont. BHP lb.-ft.	8400	8900	14985	14880	19960	19840	25210	23342
Piston speed ft./min.	1250	1500	1250	1500	1250	1500	1250	1500
LUBRICATING OIL SYSTEMS								
Lube pressure flow GPM	88	105	131	157	154	185	191	229
Lube piston cooling flow GPM	41	48	55	66	77	92	91	109
Lube scavenging flow GPM	171	205	232	279	325	390	325	390
FUEL OIL SYSTEMS								
Fuel supply pump - capacity GPM	1.8	2.1	3.8	4.5	3.8	4.5	3.8	4.5
Fuel supply pump - suction lift-max. ft.	12	12	12	12	12	12	12	12
AIR AND EXHAUST SYSTEMS								
Intake air at 14.7 psi-90°F CFM	3100	4250	6525	7640	8000	9225	10100	10725
Exhaust temperature °F	740	665	680	650	680	685	620	635
Exhaust volume @ exh. temp. CFM	6800	8650	13520	15430	16550	19200	19825	21350
Exhaust back pressure (total system) maximum allowable in. H^2O	5	5	5	5	5	5	5	5
Air intake (total system) suction-max. clean filters in. H^2O	6	6	6	6	6	6	6	6
COOLING WATER SYSTEMS								
Total engine water flow GPM	440	525	665	800	890	1070	980	1100
Pressure rise across engine water pump (Total system pressure drop) PSI	29±2	42±2	30±3	43±4	37±2	53±3	41±2	52±2
Allowable pressure drop for external piping & cooling equipment PSI	8	8	8	8	8	8	8	8
Raw water flow (with EMD available extra heat exchangers) Min. Flow — 100°F max. GPM	165	320	365	550	500	600	795	975
Min. Flow — 90°F max. GPM	130	240	280	415	400	600	580	740
Min. Flow — 80°F max. GPM	110	185	225	360	300	500	465	560
Max. raw water flow GPM	650	650	590	590	600	600	975	975
Heat exchanger raw water Δ P @ max. flow PSI	5.0	5.0	5.3	5.3	3.4	3.4	5.4	5.4

*With EMD AB21-24 Generator
**Based on Generator at 96% efficiency

Brake Specific Fuel Consumption and Lube Oil Use

MODEL S

750 RPM Continuous Rating
100% Load

UNIT	8E1	12E1	16E1	8E4C	12F4B	16F4B	20F4B
Fuel LB/BHP-HR	0.378	0.378	0.377	0.360	0.345	0.342	0.341
Lube Oil GAL/HR	0.26	0.39	0.52	0.26	0.39	0.52	0.66

MODEL S

900 RPM Continuous Rating
100% Load

UNIT	8E1	12E1	16E1	8E4C	12F4B	16F4B	20F4B
Fuel LB/BHP-HR	0.395	0.393	0.393	0.350	0.339	0.342	0.346
Lube Oil GAL/HR	0.43	0.64	0.85	0.43	0.64	0.85	1.06

Rating Condition:
- 90°F intake air temperature
- 28.25 in. Hg barometric pressure
- 19,620 BTU/LB HHV fuel [API 36]

Specific or guaranteed BSFC should be requested from EMD stating:
- Fuel Heating Value
- Altitude
- Maximum Temperature
- Penalty
- Method of Testing
- If maximum deadload pick-up is involved
- If chrome liners are to be applied

ENGINE MODEL 20-645FB PM&I DATA

LAB REPORT REFERENCE NO. 82-9-4 DATE: 16-FEB-83
FUEL SULFUR CONTENT 0.22%

Percent Load	RPM	BHP	AIR TEMP F	NOx g/bhp-hr	CO g/bhp-hr	CH2 g/bhp-hr	SO2 g/bhp-hr	O2 %	NOx g/hr	CO g/hr	CH2 g/hr	SO2 g/hr
110	900	4398	90.0	17.92	0.32	0.18	0.69	12.3	78812	1407	792	3056
100	900	4008	89.8	17.62	0.28	0.15	0.69	12.6	70621	1122	601	2780
75	900	3001	89.2	14.81	0.30	0.14	0.71	12.9	44445	900	420	2119
50	900	2000	90.5	13.57	0.32	0.18	0.75	14.8	27140	640	360	1495
25	900	999	89.4	14.72	0.88	0.39	0.93	17.3	14705	879	390	932

NOx measurement method - Chemiluminesence
CO measurement method - NDIR
CH2 (unburned hydrocarbons) measurement method - flame ionization detector
O2 measurement method - paramagnetic analyzer or calculated
SO2 was calculated based upon the assumption of 100% oxidation of the sulfur in the fuel to sulfur dioxide (SO2).

ELECTRO-MOTIVE

EMD TECHNICAL PAPER
40020885 Four Pass Aftercooler

The four pass aftercooler is an increased capacity aftercooler developed in response to the demands placed on the two pass aftercooler by greater combustion air flows required by the 710 engine series. In early testing of 710 engines equipped with the two pass aftercooler, it was found that the temperatures in the engine airbox (intake manifold) were higher than that of the 645 engine. The four pass aftercooler has improved heat transfer properties reducing the power assembly charging temperature (air box temperature at full load). It can be applied to 710G engines, 16 and 20 cylinder 645E and 645F engine series.

FEATURES

The four pass aftercooler attained greater thermal capacity due to the following improvements:

- **A water flow path which passes the water through the tube bundle 4 times**
- **A 50% increase in fin heat transfer area,** yielding improved heat transfer
- **A change in the fin material** from aluminium to copper further improving heat conductivity. Copper as utilized in the four pass aftercooler has 83% greater thermal conductivity (k)* than aluminum
- **An improvement in the aftercooler's side baffle** which assures that air is not permitted to leak around the core and escape cooling
- **Identical exterior dimensions** which allow the four pass to be installed in any application where either the P/N 9541961 or P/N 8365645 had been applied. The four pass aftercooler is field retrofittable to the 645 engine. (It can not be installed in place of the smaller p/n 8288974 unit.)

BENEFITS

With the above five improvements, the four pass aftercooler retains several advantages over it's two pass version including:

- **A reduction in airbox temperatures.** A 30-35 degree reduction in airbox temperature at the engine's rated horsepower has been measured; in the 710 engine, temperatures were restored to the levels attained in the 645 engine
- **Reduced Oxides of Nitrogen (NOx) emissions.** Previous test results have demonstrated a reduction in NOx emissions up to 15% at full horsepower
- **Fuel economy savings.** At full load, substituting the four pass aftercooler for the two pass has produced fuel savings measured from .75% to 1.5% for 710 engines and approximately .5% for 645 engines
- **Identical System Design, as a result of identical water capacity,** (approximately 85 gpm in the 16-710 engine) permits installation of the four pass aftercooler without alteration of the engine's cooling water pumps or piping circuit. This also assures that water flow to the engine's power assemblies is not altered by diversion of a greater quantity of water to the aftercoolers

ENGINE EMISSIONS

The four pass aftercooler lowers the airbox charge temperature, engine peak combustion temperatures and exhaust temperatures and therefore reduces NOx emissions from our engines. The NOx formation reactions are highly thermal sensitive, so an enhanced charge cooling is an effective way to reduce NOx emissions.

* ref. Keith, Frank, Principles of Heat Transfer, 2nd Ed., International Textbook Co., Scranton PA., 1965, p. 593

ENGINE FUEL ECONOMY

The application of aftercooling to a turbocharged Diesel engine is known to have advantages in the areas of fuel economy and in the emissions of oxides of nitrogen (NOx). The fuel economy advantages of the four pass aftercooler in the 710 engine series has shown to produce fuel economy improvements in the range of .75% to 1.5% at the engine's rated speed and load. When these improvements are applied to the annual fuel consumption of a locomotive, they will show an attractive return on the investment represented by the price premium of the four pass aftercooler over its two pass predecessor. The investment payback periods of the four pass aftercooler used in 645 and 710 engines have ranged from one to two years, depending on annual fuel consumption.

PERFORMANCE ADVANTAGE CONDITIONS

The four pass aftercooler provides superior performance over the two pass at the following conditions:

- High engine air flow rates, such as in the 710 engine series (particularly the 16 and 20 cylinder versions of the 710)
- Operating conditions which produce high air flows. For example:
  - At throttle settings six through eight. These are the conditions at which the turbocharger is operating "off the geartrain" and air flow rates and air compression ratios are highest
  - High ambient temperatures and/or high altitudes result in particularly high turbocharger discharge temperatures. Under these especially demanding conditions, the benefits of the four pass are even greater than that of the two pass

PRODUCT RELIABILITY

The superior construction of the four pass aftercooler makes it a reliable, high performance heat transfer product built to last. The four pass and two pass aftercoolers have identical major features of construction, such as retention of the reliable rolled mechanical bond between the aftercooler's red brass tubes and the tube bundle's header plates. This method of construction has proved reliable in the two pass aftercooler design and in the premium mechanically-bonded radiators.

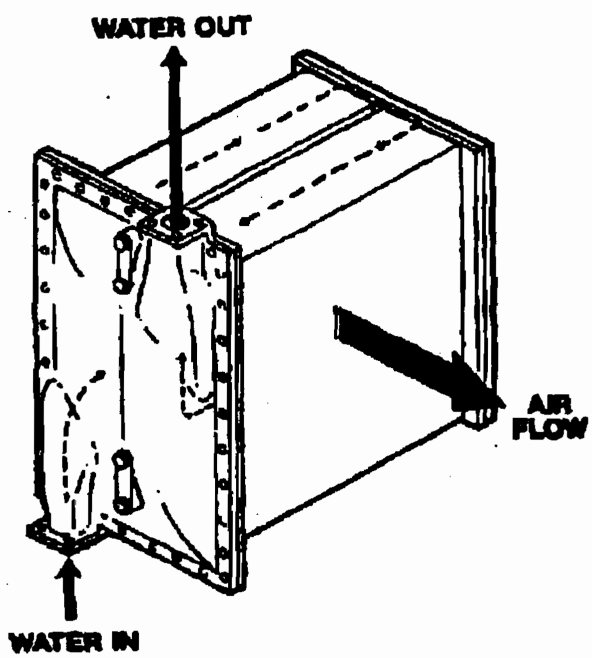
CONCLUSION

The value of the four pass aftercooler is evident in the areas of improved air box temperatures, engine emission reductions and improved fuel economy. Electro-Motive, in partnership with Young Radiator, has demonstrated their commitment to accepting and meeting the performance challenges of the rail industry. It is this partnership that continues to provide the best heat transfer products to the industry. The four pass aftercooler is the latest product of this commitment.

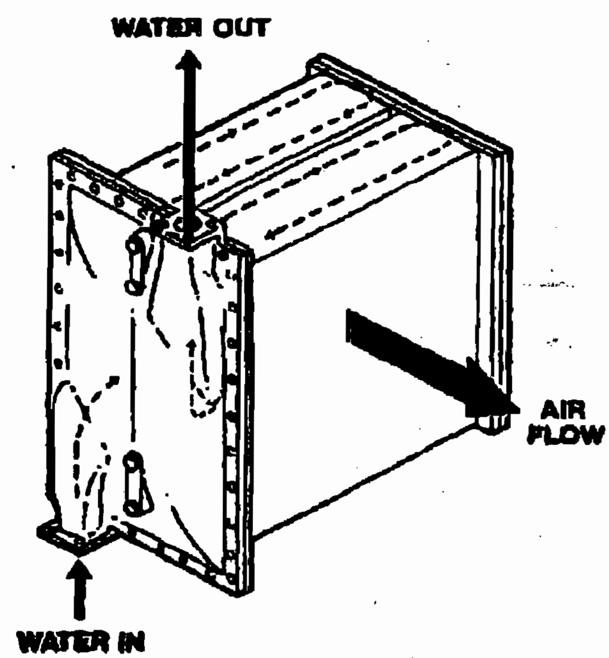
Note: A performance comparison of the four pass and two pass aftercooler depends on which particular engine it is installed in and on the power at which they are compared. EMD welcomes the opportunity to provide technical expertise to discuss individual railroad needs.

ELECTRO-MOTIVE

2-PASS AFTERCOOLER



4-PASS AFTERCOOLER
(Baffles not shown for clarity)



ELECTRO-MOTIVE
Electro-Motive Division
General Motors Corporation
LaGrange, IL [illegible]
Telex: 270041 McCook, IL USA
Telephone: (708) [illegible]
Fax: (708) [illegible]

Diesel Division
General Motors of Canada Limited
Box 5160, London, Ontario N6A [illegible]
Telex: [illegible] Canada
Telephone: (519) [illegible]
Fax: (519) [illegible]

4-PASS-992

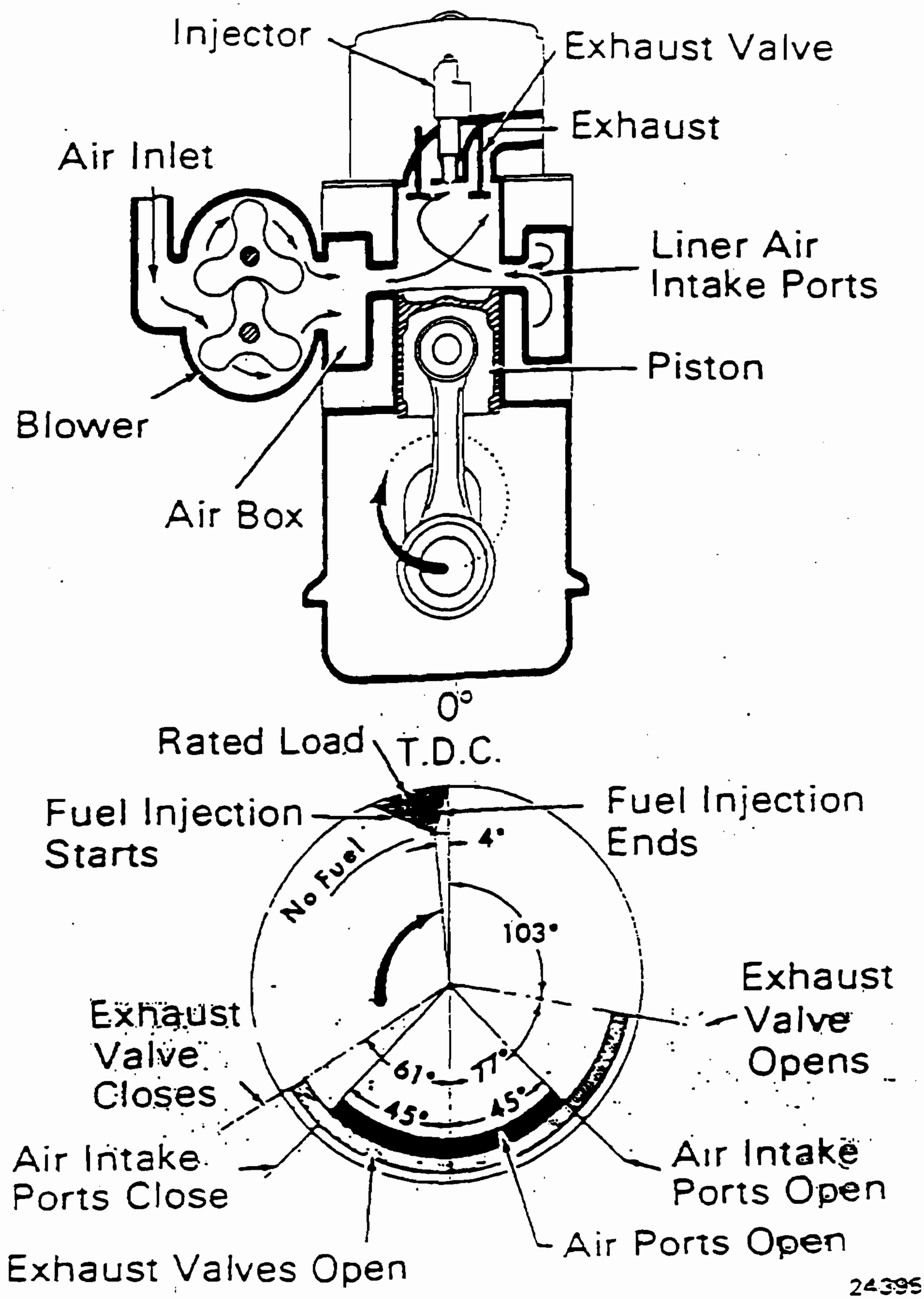


Fig.0-1 – Schematic Illustration Of

BEST AVAILABLE COPY

ENGINE SYSTEMS, INC.
1220 S. Washington St.
Rocky Mount, NC 27801

TELEFAX

Date:	12/3/97
To:	Dave Lindberg
Company:	CH2M Hill
Phone Number:	
Fax Number:	(305)443-8856
From:	Michael Thiel
Phone Number:	(919)407-8228
Fax Number:	(919)446-3830
Total Pages:	3

Reference: **Miami-Dade (EMD 20-645F4B)**

Best Regards,

Michael J. Thiel

Michael J. Thiel
Sales Support Engineer

Engine Systems, Inc.
1220 S. Washington St.
Rocky Mount, NC 27801

Tel: (919)407-8228
Fax: (919)446-3830

October 24, 1997

Attn: Deborah Donovan
New England Power - Brayton Point
Tel: (508)389-2590
Fax: (508)646-5401

RE: EMD 20-645E4 Diesel Engines

Dear Deborah:

Regarding your request for information pertaining to exhaust back pressure limits, I have the following information to offer:

A) EMD strongly recommends that total system exhaust back pressure not exceed 5 in H_2O for turbocharged engines. This design requirement is based upon protecting the turbocharger and other engine components from catastrophic failure.

B) Catastrophic failure of the turbocharger may result from an overspeed condition. An overspeed condition will occur from overheating as a result of a flash fire in the engine. A flash fire may occur due to heavy carbon deposits in the airbox. The carbon deposits are a result of incomplete fuel combustion in the power pack assemblies due to restricted breathing across the packs. The restricted air flow is a direct result of high exhaust back pressure.

C) Electronic monitoring of the engine will most likely be ineffective in preventing catastrophic failure of the turbocharger. In the event of a flash fire, an overheat/overspeed condition will be almost instantaneous. In this case, shutting the engine down immediately would be "too little, too late". Frequent visual inspections to check for heavy carbon deposits and manual cleanouts of the airbox would be more effective preventive measures.

D) EMD has stated that intermittent (e.g., short infrequent durations) maximum total system exhaust back pressure not exceed 15 in H_2O for turbocharged engines. This design requirement is intended for special critical applications requiring increased back pressure.

Attachment 7

Compliance Test Results

Alexander Orr, Jr. Water Treatment Plant

ATTACHMENT 7

Compliance Test Results

Testing was conducted September 23–October 2, 1997, on all four standby generators, and on Pump Nos. 1, 3, 4, 5, and 6. The final emissions testing report was subsequently submitted to FDEP Southeast District.

Reported emissions from the standby generators represent operation without installation of BACT. Following installation of BACT, the standby generators will be tested to demonstrate compliance with the emissions limits proposed in this application. Emissions test results from Pump Nos. 1, 3, 4, and 5 complied with the proposed emissions limits. It is believed that improper engine tuning caused emissions test results from Pump No. 6 to exceed the proposed emissions limits. Miami-Dade WASD is planning to reschedule testing of Pump No. 6 to demonstrate compliance with the proposed emissions limits.

Attachment 8

Procedures for Startup and Shutdown

Alexander Orr, Jr. Water Treatment Plant

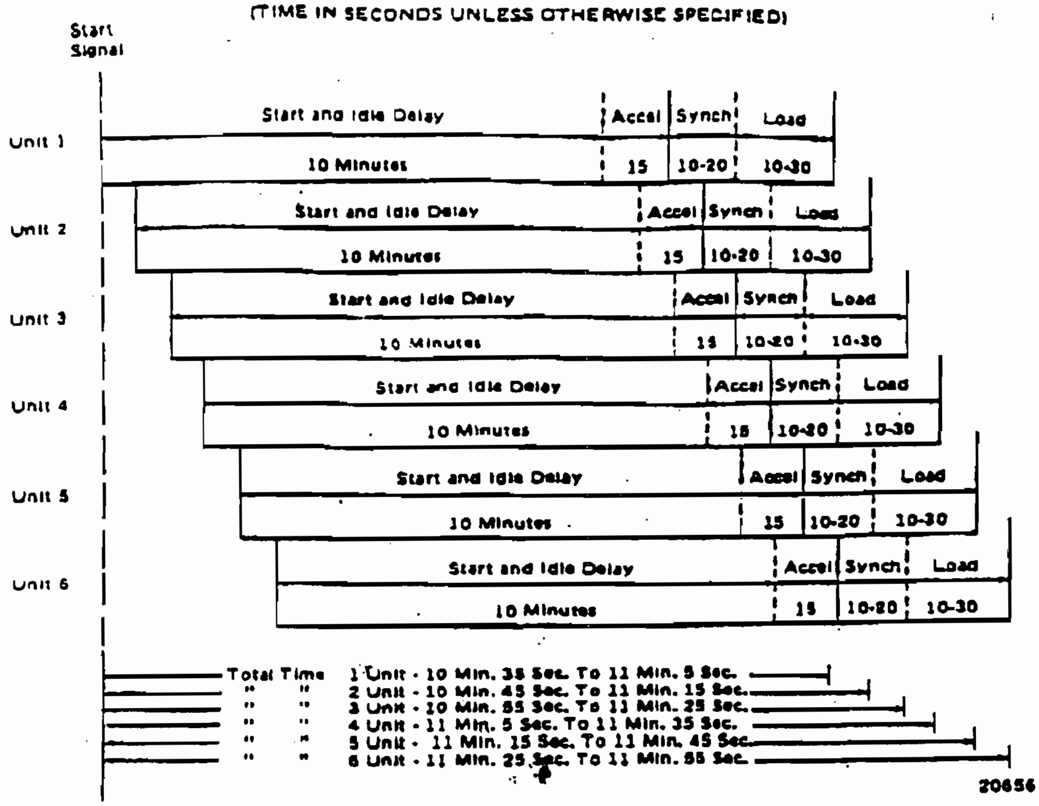


Fig. 1-3 – Starting Time Of Power Plant (Normal Start Peaking Duty)

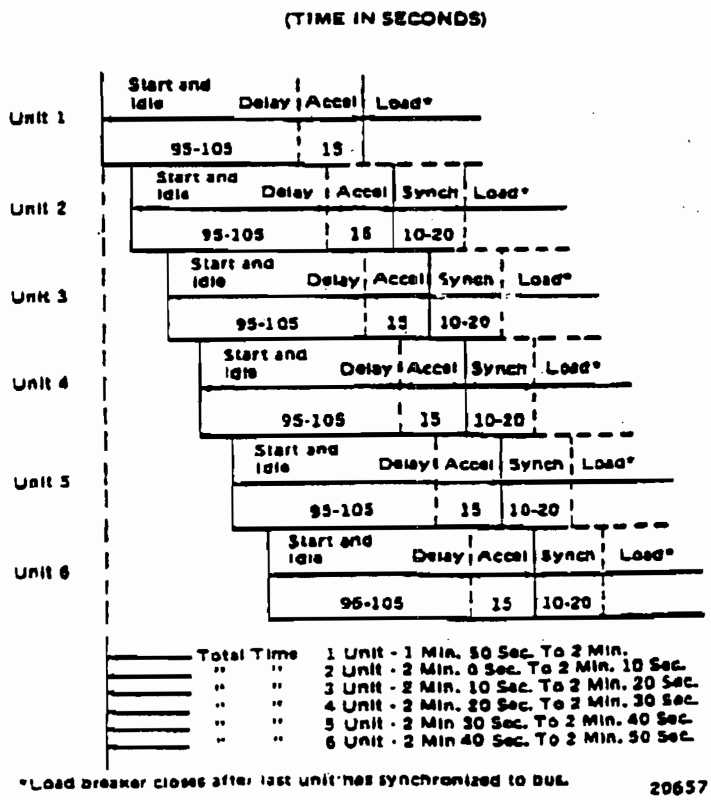


Fig. 1-4 – Starting Time Of Power Plant (Deadline Start)

APPENDIX B

Modeling Protocol

Description of Stack Sampling Facilities
Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department

4 Standby Generator Sets (20F4B)

Inside Diameter: 21 inches

Orientation: Vertical

Height Above Grade: 16 ft

Means of Access: ladder to rooftop.

Sampling Ports: The presence of exhaust silencers prevent the installation of sampling ports. The applicant proposes to conduct sampling through a rake probe, which composites exhaust gas collected at several points across the stack diameter. The rake probe can be inserted into end of stack.

Diesel Engine-Driven Pump Nos. 1, 3, & 4

Inside Diameter: 7 inches

Orientation: Vertical

Height Above Grade: 28 ft

Means of Access: Staircase inside building leads to rooftop.

Sampling Ports: The applicant proposes to conduct sampling through a rake probe, which composites exhaust gas collected at several points across the stack diameter. The rake probe can be inserted into end of stack.

Note: plans are being made to replace these engines with new spark ignition gas engines. A construction permit application for the new engine will be submitted upon completion of the design.

Diesel Engine-Driven Pump No. 5

Inside Diameter: 10 inches

Orientation: Vertical

Height Above Grade: 31 ft

Means of Access: Staircase inside building leads to rooftop.

Sampling Ports: The presence of an exhaust silencer prevents the installation of sampling ports. The applicant proposes to conduct sampling through a rake probe, which composites exhaust gas collected at several points across the stack diameter. The rake probe can be inserted into end of stack.

Note: plans are being made to replace this engine with a new spark ignition gas engine. A construction permit application for the new engine will be submitted upon completion of the design.

Description of Stack Sampling Facilities
Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department

Dual Fuel Engine-Driven Pump No. 6

Inside Diameter:	10 inches
Orientation:	Vertical
Height Above Grade:	28 ft
Means of Access:	Staircase inside building leads to rooftop.
Sampling Ports:	The presence of an exhaust silencer prevents the installation of sampling ports. The applicant proposes to conduct sampling through a rake probe, which composites exhaust gas collected at several points across the stack diameter. The rake probe can be inserted into end of stack.

E) The Oxidation Catalyst Test System described indicates the total system back pressure will increase from 4.3 in H_2O baseline to approximately 7-11 in H_2O. This system will drastically reduce the design safety factor of the engine and increase the potential for catastrophic failure.

F) Increasing the exhaust back pressure will also result in the following adverse conditions:

- Engine performance will decrease resulting in the inability to quickly adjust to dynamic load conditions.
- Engine efficiency will decrease resulting in increased fuel consumption.
- Engine emissions will increase based upon incomplete fuel combustion.
- Maximum engine horsepower will decrease slightly.

G) For your specific test scenario, Engine Systems, Inc. and/or Electro-Motive Division of General Motors can not be held responsible for any problems or failures that may arise. Final risk assessment, design review and test monitoring of this particular test system will be the sole responsibility of New England Power.

Sincerely,

Michael J. Thiel

Michael J. Thiel
Sales Support Engineer

Attachment 6

Description of Stack Sampling Facilities

Alexander Orr, Jr. Water Treatment Plant

CH2MHILL

CH2M HILL
701 B Street
Suite 700
San Diego, CA
92101-8120
Tel 619.687.0110
Fax 619.687.0111

February 21, 1997

139633.AP

Mr. Martin Costello
Florida Department of Environmental Protection
Division of Air Resources Management
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Mr. Costello:

Subject: Modeling Protocol
Proposed Standby Power Generators
Miami-Dade Water and Sewer Department
Alexander Orr Water Treatment Plant

The Miami-Dade Water and Sewer Department (WASD) will apply for a permit to operate standby generators at three of its facilities: the Central District Wastewater Treatment Plant, located on Virginia Key in Miami; the Alexander Orr Water Treatment Plant, located at 6800 SW 87th Avenue in Miami; and the John E. Preston Water Treatment Plant, located at 1100 W 2nd Avenue in Hialeah. The Central District and Alexander Orr facilities are major sources of criteria pollutant emissions with respect to prevention of significant deterioration (PSD), and estimated emissions from the standby generators at the desired level of operation will constitute a significant net emissions increase. The Preston facility is a minor source of criteria pollutant emissions, but the estimated emissions increase from the standby generators at the desired level of operation will constitute a major source by itself. As such, permitting of these sources will be subject to PSD review. Separate permit applications will be submitted for each source.

CH2M HILL has prepared this Modeling Protocol in order to obtain consensus from Florida Department of Environmental Protection (FDEP) on the approach to be taken for the air quality impact analyses that will be required as part of the PSD reviews for these projects. The contents of the proposed modeling protocol are based on recent communications with Mr. Cleve Holliday of your staff, as well as our experience in conducting previous dispersion modeling studies in Florida.

Project Background

PSD permit applications will be prepared and submitted for the following sources:

- At the Central District Wastewater Treatment Plant, three existing (previously exempt) 3,600 horsepower (hp) diesel-fueled internal combustion (IC) engines, each driving an associated 2,500 kilowatt (kW) electrical generator; and one new 3,800 hp diesel-fueled IC engine, driving a 2,700 kW electrical generator.
- At the Alexander Orr Water Treatment Plant, five 3,800 hp diesel-fueled IC engines (four existing - previously exempt - and one new), each driving an associated 2,700 kW electrical generator;
- At the John E. Preston Water Treatment Plant, three existing (previously exempt) 3,600 hp diesel-fueled IC engines, each driving an associated 2,500 kW electrical generator; and three new 3,800 hp diesel-fueled IC engines, each driving an associated 2,700 kW electrical generator.

Pollutants to be Evaluated

The proposed projects will increase emissions of NOx, sulfur dioxide (SO_2), and particulate matter (PM_{10}) by significant quantities (as defined by the PSD regulations). Emissions of these pollutants will be evaluated in the PSD applications. Emissions of other pollutants are not expected to be significant as a result of operating the proposed sources, but will be evaluated in each application.

Emissions Inventory (Proposed Emission Sources)

An emissions inventory will be prepared for proposed operation of the standby generators to facilitate a comprehensive dispersion analysis of PSD pollutants emitted. The inventory will based on the worst-case scenario of operating each plant entirely on power produced by the standby generators. Plant loads are approximately 7,000 kW (Central District - including electrical load from the future oxygen plant); 8,000 kW (Alexander Orr); and 9,000 kW (John E. Preston). Therefore, it will be necessary that the plants be capable of operating 3 standby generators sets (Central District) or 4 generator sets (Alexander Orr and John E. Preston) simultaneously in order to accommodate worst-case demand scenarios. Additional generator sets are present at each facility and will be operated; however, maximum operation will not exceed the levels stated above.

The emissions inventory will be utilized to determine the source's PSD increment consumption (NOx, SO_2, and PM_{10}) and to demonstrate compliance with the national ambient air quality standards (NAAQS) for these pollutants. The general approach will be to perform initial modeling and screening analyses using a single year of meteorological data in order to identify the area of significant air quality impacts. Subsequent detailed modeling will be conducted for pollutants having a significant impact on air quality using all five years of meteorological data. The results of the detailed 5-year modeling will be included in the permit application submittal in both hard copy and electronic format.

Best Available Control Technology Demonstration (BACT)

BACT will be utilized for all pollutants that will be emitted in significant quantities (NOx, SO_2, and PM_{10}). BACT will be determined by obtaining information from EPAs RACT/BACT/LAER Clearinghouse database and by contacting select state and agency personnel to ensure that the most recent PSD permit determinations will be considered in the determination of what constitutes BACT. In accordance with State and Federal guidance, the BACT demonstration for this project will follow the "top-down" approach.

It is currently expected that BACT for NOx emissions will consist of combustion air precooling plus fuel injection timing retard (FITR) technology. BACT for SO2 and PM10 emissions will consist of a fuel oil sulfur content restriction of 0.05 weight percent and efficient combustion practices (FITR).

Emission Inventory (Other Emission Sources)

If the predicted impact of the proposed source is greater than the PSD significant impact thresholds, it will be necessary to model other emission sources (using five years of meteorological data) along with the emissions from the proposed source for the purpose of determining PSD increment consumption and/or demonstrating compliance with the NAAQS. If this is necessary, a written request for an inventory of PSD and baseline emission sources will be submitted to FDEP. Such a request will specify the proposed location of the source and the predicted radii of significant impact of the facility (by pollutant).

Dispersion Model

The dispersion model to be used in the modeling analysis will be EPA's most recent version of the Industrial Source Complex Model (ISC3) as is available from EPAs Technology Transfer Network (TTN) Bulletin Board. The ISC3 model will be used for all averaging periods (including annual) for all pollutants to be modeled. Horizontal stacks, present at the Alexander Orr Water Treatment Plant, will be modeled with a negligible exit velocity (0.1 m/s) and an effective stack diameter to conserve stack flow rate while retaining the effect of thermal buoyancy.

Meteorological Data

In accordance with FDEP guidance, the meteorological data that will be used in the modeling will consist of five years of Miami International Airport surface air data and West Palm Beach upper air data. The data have been obtained from the EPA TTN bulletin board and processed using EPAs most recent meteorological data processing program, the Meteorological Processor for Regulatory Models (MPRM). The five year period of record for the data to be used will be 1987 - 1991.

Receptor Data

Maximum concentrations will be identified with a resolution of at least 100 meters in the receptor grid. The general approach will be to perform initial modeling with a coarse spacing not greater than 500 meters, followed by refined modeling with a closer receptor spacing of 100 meters. The initial modeling will allow the determination of the radius of significant impact of the facility by pollutant, averaging period, and year of meteorological data. Areas within the radii of significant impact where high concentrations are predicted will be subjected to increased scrutiny in the refined modeling.

Model Options

The regulatory default, simple terrain, and rural dispersion options will be selected for all model runs. Building heights for structures within 5L of the sources, where L is the minimum of the building height or the maximum projected building width, will be identified for modeling purposes to facilitate calculation of downwash and building wake effects by the model.

PSD Class I Areas

All three facilities are located within 100 kilometers (km) of the Everglades National Park, which has been designated a Federal Class I area. Since the Everglades National Park is a Federal Class I area, it will be necessary to evaluate the impacts of the proposed source on air quality related values. The Federal Land Manager will be contacted to determine the appropriate level of analysis.

Nonattainment Areas

There are no nonattainment areas for any pollutants located within 200 km of the proposed source. Therefore it is assumed that there will be no need to evaluate the impacts of the proposed source on any nonattainment area.

Background Air Quality Data

Preconstruction air quality monitoring data must be obtained and included in the air quality impact analysis for all PSD pollutants. It is our understanding that air quality monitoring data is available in the Miami area. If initial modeling of emission from the proposed source indicates that the pollutants will be present in excess of PSD significant impact levels, we will request that FDEP provide us with background ambient air quality levels for this area. The data will be used to demonstrate that the NAAQS will not be threatened or exceeded as a result of the operation of the proposed source.

Determination of PSD Increment Consumption

If the predicted impacts of the proposed source exceed the PSD significant impact levels for any criteria pollutants, then a modeling analysis will be conducted to predict the PSD increment consumption for those pollutants in the area surrounding the source. This will be accomplished by modeling, in conjunction with the proposed source emissions, all other

PSD increment consuming sources identified and provided to the applicant by FDEP. The modeling will be conducted within the area of significant impact (for each pollutant) as determined by modeling only the proposed source emissions (see previous), using five years of meteorological data.

Demonstration of Compliance with NAAQS

If the predicted impacts of the proposed source exceed the PSD significant impact levels, a demonstration of compliance with the NAAQS will be conducted for all pollutants that have a significant impact. This will be conducted by modeling, in conjunction with the proposed source emissions, all other PSD and baseline emission sources identified and provided to the applicant by FDEP. The modeled impacts of all other PSD and baseline sources will be added to the ambient air quality background data that will be supplied by FDEP (see previous). The modeling will be conducted within the area of significant impact (for each pollutant) as determined by modeling only the proposed source emissions (see previous), using five years of meteorological data.

Modeling Results

The results of the modeling analysis will be summarized in a chapter of a PSD Permit Application Report that will be submitted to FDEP.

****

We request that FDEP provide us with written concurrence on the above described approach. If you should have any questions, comments, or suggestions regarding the above, please do not hesitate to call me at (619) 687-0110. My FAX number is (619) 687-0111.

Sincerely,

CH2M HILL

David Lindberg

David Lindberg, P.E.
Project Engineer

cc: Bertha Goldenberg/Miami-Dade WASD
George Howroyd/CH2M HILL
John Castleberry/CH2M HILL

APPENDIX C

Dispersion Modeling Input and Output Files

Appendix C

Initial (Screening) Dispersion Model Input and Output Summaries

Alexander Orr, Jr. Water Treatment Plant

Summary of Dispersion Modeling Results (Full Load)
Alexander Orr, Jr. WTP Standby Generators with Vertical Stacks
Miami-Dade Water and Sewer Department

Pollutant	Averaging Period	Significant Impact Level: Class II	Significant Impact Level: Class I		Maximum Predicted Offsite NO_2 Concentration ($\mu g/m^3$): 1987	1988	1989	1990	1991	Maximum Radius of Significant Impact (m)
NO_2	Annual	1		High Conc - Class II ($\mu g/m^3$)	15.1	21.0	23.7	20.8	17.7	
				Maximum ROI (m)	5,000	6,000	7,000	6,000	5,000	7,000
			0.1	High Conc - Class I ($\mu g/m^3$)	0.28	0.22	0.27	0.34	0.25	

PM_{10} emissions are insignificant for operation less than 20,980 hours per year (total).

NO_2/NO_x = 0.75
Q_s = 11.61 g/s NOx (total)

Allowable Operation 14,000 hours/year (total)
Allowable Power Output 40,110,000 kW-hrs (total)

```
NO ECHO
CO STARTING
  TITLEONE Standby Generator Sets - Significant Impacts - 1987
  TITLETWO Miami-Dade Water and Sewer Department Alexander Orr WTP
  MODELOPT DFAULT CONC RURAL
  TERRHGTS FLAT
  AVERTIME 1  24  period
  POLLUTID ALL
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CO FINISHED
SO STARTING
** LOCATION SRC-ID TYPE UTM X (m) UTM Y (m) Z (m)
  LOCATION AOGENS POINT 566509.4  2843411.8 0.00
** SRCPARAM SRC-ID EMIS Hgt temp,X,sy vel,y,sz dia,ang
  SRCPARAM AOGENS 1.0000  4.72  608.0  45.19 0.53
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  GRIDPOLR POL1 DIST  1750   2000   2250   2500   3000
  GRIDPOLR POL1 DIST  3500   4000   4500   5000   6000
  GRIDPOLR POL1 DIST  7000   8000   9000   10000   11000
  GRIDPOLR POL1 DIST  12000   13000   14000   15000   16000
  GRIDPOLR POL1 GDIR  36   10   10
  GRIDPOLR POL1 END
** Receptors at fenceline, r = 250 m, and Everglades NP
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  ANEMHGHT  10  METERS
  SURFDATA  12839  1987
  UAIRDATA  12844  1987
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  MAXTABLE ALLAVE  50
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*** ISCST3 - VERSION 96113 ***   *** Standby Generator Sets - Significant Impacts - 1987          ***      2-DEC-97
                 *** Miami-Dade Water and Sewer Department Alexander Orr WTP          ***      15:22:38
                                                               PAGE  2
 *** MODELING OPTIONS USED:  CONC                    RURAL  FLAT        DFAULT
*** POINT SOURCE DATA ***

NUMBER EMISSION RATE               BASE     STACK   STACK    STACK      STACK   BUILDING EMISSION RATE
  SOURCE    PART.  (GRAMS/SEC)    X       Y     ELEV.   HEIGHT  TEMP.  EXIT VEL. DIAMETER  EXISTS  SCALAR VARY
   ID     CATS.            (METERS) (METERS) (METERS) (METERS) (DEG.K)  (M/SEC)  (METERS)              BY
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

  AOGENS       0  0.10000E+01  566509.4 2843411.8    0.0     4.72   608.00    45.19     0.53      YES
```

*** MODELING OPTIONS USED: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG) OF TYPE	GRID-ID
ALL	1ST HIGHEST VALUE IS	1.72925	AT (566343.31, 2843524.50, 0.00, 0.00) DC	NA
	2ND HIGHEST VALUE IS	1.64261	AT (566087.31, 2843173.75, 0.00, 0.00) DC	NA
	3RD HIGHEST VALUE IS	1.58877	AT (566076.38, 2843161.75, 0.00, 0.00) GP	POL1
	4TH HIGHEST VALUE IS	1.58493	AT (566370.81, 2843561.00, 0.00, 0.00) DC	NA
	5TH HIGHEST VALUE IS	1.44886	AT (566087.31, 2843223.75, 0.00, 0.00) DC	NA
	6TH HIGHEST VALUE IS	1.44661	AT (566296.13, 2843507.75, 0.00, 0.00) DC	NA

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG) OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	198.28949	ON 87031503:	AT (566190.00, 2843123.75, 0.00, 0.00) DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG) OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	35.20385	ON 87022824:	AT (566370.81, 2843561.00, 0.00, 0.00) DC	NA

```
 *** MODELING OPTIONS USED:  CONC                    RURAL  FLAT        DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD (  8784 HRS) RESULTS ***
** CONC OF ALL      IN MICROGRAMS/M**3                    **

                                                            NETWORK
GROUP ID                 AVERAGE CONC             RECEPTOR  (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL     1ST HIGHEST VALUE IS       2.41045 AT (  566370.81,  2843561.00,     0.00,     0.00)  DC     NA
        2ND HIGHEST VALUE IS       2.13832 AT (  566343.31,  2843524.50,     0.00,     0.00)  DC     NA
        3RD HIGHEST VALUE IS       1.95393 AT (  566392.13,  2843591.50,     0.00,     0.00)  DC     NA
        4TH HIGHEST VALUE IS       1.66759 AT (  566348.69,  2843603.25,     0.00,     0.00)  DC     NA
        5TH HIGHEST VALUE IS       1.60719 AT (  566317.88,  2843572.50,     0.00,     0.00)  DC     NA
        6TH HIGHEST VALUE IS       1.51237 AT (  566087.31,  2843223.75,     0.00,     0.00)  DC     NA

*** THE SUMMARY OF HIGHEST  1-HR RESULTS ***
** CONC OF ALL      IN MICROGRAMS/M**3                    **

                                    DATE                                 NETWORK
GROUP ID                  AVERAGE CONC      (YYMMDDHH)           RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL     HIGH  1ST HIGH VALUE IS     182.07993  ON 88061624: AT (  566190.00,  2843123.75,     0.00,     0.00)  DC     NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***
** CONC OF ALL      IN MICROGRAMS/M**3                    **

                                    DATE                                 NETWORK
GROUP ID                  AVERAGE CONC      (YYMMDDHH)           RECEPTOR  (XR, YR, ZELEV, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL     HIGH  1ST HIGH VALUE IS      40.33925  ON 88112224: AT (  566370.81,  2843561.00,     0.00,     0.00)  DC     NA
```

*** MODELING OPTIONS USED: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	1ST HIGHEST VALUE IS	2.72307	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	2.48507	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	2.24467	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.98035	AT (566348.69, 2843603.25, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	1.77674	AT (566317.88, 2843572.50, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	1.74048	AT (566430.19, 2843605.25, 0.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	206.97986	ON 89012824:	AT (566190.00, 2843123.75, 0.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	44.69877	ON 89061524:	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA

```
*** MODELING OPTIONS USED:  CONC          RURAL  FLAT     DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD (  8760 HRS) RESULTS ***
** CONC OF ALL     IN MICROGRAMS/M**3                 **

                                                  NETWORK
GROUP ID            AVERAGE CONC        RECEPTOR  (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL    1ST HIGHEST VALUE IS      2.39027 AT (  566370.81,  2843561.00,    0.00,    0.00)  DC    NA
       2ND HIGHEST VALUE IS      2.01389 AT (  566343.31,  2843524.50,    0.00,    0.00)  DC    NA
       3RD HIGHEST VALUE IS      1.80685 AT (  566087.31,  2843173.75,    0.00,    0.00)  DC    NA
       4TH HIGHEST VALUE IS      1.77289 AT (  566076.38,  2843161.75,    0.00,    0.00)  GP    POL1
       5TH HIGHEST VALUE IS      1.72844 AT (  566392.13,  2843591.50,    0.00,    0.00)  DC    NA
       6TH HIGHEST VALUE IS      1.70903 AT (  566090.00,  2843123.75,    0.00,    0.00)  DC    NA

*** THE SUMMARY OF HIGHEST  1-HR RESULTS ***
** CONC OF ALL     IN MICROGRAMS/M**3                 **

                              DATE                                    NETWORK
GROUP ID                 AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)   OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL    HIGH  1ST HIGH VALUE IS    206.90305  ON 90041601: AT (  566190.00,  2843123.75,    0.00,    0.00)  DC    NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***
** CONC OF ALL     IN MICROGRAMS/M**3                 **

                              DATE                                    NETWORK
GROUP ID                 AVERAGE CONC    (YYMMDDHH)          RECEPTOR  (XR, YR, ZELEV, ZFLAG)   OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL    HIGH  1ST HIGH VALUE IS     35.59268  ON 90022224: AT (  566370.81,  2843561.00,    0.00,    0.00)  DC    NA
```

*** MODELING OPTIONS USED: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	1ST HIGHEST VALUE IS	2.03499	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	1.98835	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	1.72168	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	1.69225	AT (566140.00, 2843123.75, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	1.67981	AT (566090.00, 2843123.75, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	1.56064	AT (566190.00, 2843123.75, 0.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	206.49405	ON 91050203:	AT (566190.00, 2843123.75, 0.00, 0.00)	DC	NA

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF ALL IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	DATE (YYMMDDHH)	NETWORK RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	GRID-ID
ALL	HIGH 1ST HIGH VALUE IS	31.66023	ON 91032924:	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA

Summary of Maximum Predicted PSD Increment Consumption in Everglades National Park Class I Area - NO_2
Vertical Generator Stacks and Site-Specific Emissions
Alexander Orr, Jr. WTP
Miami-Dade Water and Sewer Department

	Maximum Predicted Offsite Increment Consumption (µg/m3)				
	1987	**1988**	**1989**	**1990**	**1991**
Maximum Predicted Impact	0.61	0.60	0.51	0.86	0.75
PSD Increment	2.50	2.50	2.50	2.50	2.50
Location	(17019 m, 288 deg)	(17019 m, 288 deg)	(16020 m, 268 deg)	(17019 m, 288 deg)	(17019 m, 288 deg)

Q_s = 11.61 g NOx/s   standby gens   hrs/yr = 14,000 (total)   40,110,000 kW-hr (total)

* PM10 emissions do not exceed PSD significant emission rates.

Appendix C

Class I Area Dispersion Model Input and Output Summaries

Alexander Orr, Jr. Water Treatment Plant

Summary of Maximum Predicted Ambient NO2 Concentrations in Everglades National Park Class I Area - Annual Average
ISC Run 10: Vertical Generator, Pump 5, and Pump 6 Stacks (Site-Specific Emissions) and Diesel Pump Engines ("Reduced "Site-Specific Emissions)
Alexander Orr, Jr. WTP
Miami-Dade Water and Sewer Department

	Maximum Predicted Offsite Concentration (µg/m3)				
	1987	**1988**	**1989**	**1990**	**1991**
Maximum Predicted Impact - Class I Area	3.4	3.4	2.9	4.4	4.1
1996 Background[1]	12.0	12.0	12.0	12.0	12.0
Maximum Predicted Concentration	15.4	15.4	14.9	16.4	16.1
NAAQS	100.0	100.0	100.0	100.0	100.0
Location	(17019 m, 288 deg)	(17019 m, 288 deg)	(17019 m, 288 deg)	(16020 m, 268 deg)	(17019 m, 288 deg)

1 Background concentration for 1997 at Virginia Key monitoring station.

standby gens Q_s = 11.61 g NOx/s	hrs/yr = 14,000 (total)	site-specific emissions	40,110,000 kW-hr (total)
Worthington #6 Q_s = 2.30 g NOx/s	continuous	site-specific emissions	
Diesel Pumps 1, 3 & 4 Q_s = 0.70 g NOx/s	one @ 50% operation	site-specific emissions	

* PM10 emissions do not exceed significant emission rates.

```
NO ECHO
CO STARTING
  TITLEONE Standby Generator Sets - NAAQS & PSD Class I Increment - NO2 - 1987
  TITLETWO Miami-Dade Water and Sewer Department Alexander Orr WTP Standby Generators
  MODELOPT DFAULT CONC RURAL
  TERRHGTS FLAT
  AVERTIME PERIOD
  POLLUTID NO2
  RUNORNOT RUN
CO FINISHED
SO STARTING
** LOCATION SRC-ID TYPE UTM X (m) UTM Y (m) Z (m)
** PSD Increment Consuming Sources
  LOCATION AOGENS POINT 566509.0  2843411.0 0.00
  LOCATION HPGENS POINT 571491.6  2857105.1 0.00
  LOCATION CDGENS POINT 584959.0  2847790.0 0.00
  LOCATION SBROWRRF POINT 579600.0  2883300.0 0.00
  LOCATION NBROWRRF POINT 583600.0  2907600.0 0.00
  LOCATION TARMAC1 POINT 562900.0  2861700.0 0.00
  LOCATION TARMAC2 POINT 562900.0  2861700.0 0.00
  LOCATION TARMAC3 POINT 562900.0  2861700.0 0.00
  LOCATION DCRRF12 POINT 564390.0  2857390.0 0.00
  LOCATION DCRRF34 POINT 564360.0  2857390.0 0.00
  LOCATION DCRRF5 POINT 564300.0  2857400.0 0.00
  LOCATION FPLF14 POINT 580100.0  2883300.0 0.00
** Baseline Sources
  LOCATION AOLIME POINT 566466.7  2843216.5 0.00
  LOCATION AOPUMP6 POINT 566598.0  2843570.0 0.00
  LOCATION AOPUMP1 POINT 566598.0  2843531.0 0.00
  LOCATION TARMAC3B POINT 562900.0  2861700.0 0.00
  LOCATION DCRRF12B POINT 564390.0  2857390.0 0.00
  LOCATION DCRRF34B POINT 564360.0  2857390.0 0.00
  LOCATION FPLF112 POINT 580100.0  2883300.0 0.00
  LOCATION FPLF1324 POINT 580100.0  2883300.0 0.00
  LOCATION FPLF45B POINT 580100.0  2883300.0 0.00
  LOCATION FPLC5 POINT 570400.0  2834900.0 0.00
  LOCATION FPLC6 POINT 570400.0  2834900.0 0.00
  LOCATION FPLPE12 POINT 587400.0  2875300.0 0.00
  LOCATION FPLPE34 POINT 587400.0  2875300.0 0.00
  LOCATION FPLPE112 POINT 587400.0  2875300.0 0.00
  LOCATION FPLTP12 POINT 567200.0  2831200.0 0.00
  LOCATION RINKER12 POINT 558200.0  2851300.0 0.00
  LOCATION LCRRF POINT 424000.0  2946000.0 0.00
  LOCATION BECHTEL POINT 545600.0  2991500.0 0.00
  LOCATION OKEELANT POINT 525000.0  2939400.0 0.00
  LOCATION OSCEOLA POINT 544200.0  2968000.0 0.00
** SRCPARAM SRC-ID EMIS Hgt temp,X,sy vel,y,sz dia,ang
** PSD Increment Consuming Sources
  SRCPARAM AOGENS 11.6100  3.50  608.0  0.10 11.32
  SRCPARAM HPGENS 10.6800  8.80  608.0  45.19 0.53
  SRCPARAM CDGENS 10.8100  6.40  663.0  16.50 0.91
  SRCPARAM SBROWRRF 68.5500  59.44  381.0  17.98 3.96
  SRCPARAM NBROWRRF 64.0000  58.50  381.0  18.01 3.96
  SRCPARAM TARMAC1 21.1400  60.96  465.0  12.80 2.44
  SRCPARAM TARMAC2 12.8900  60.96  422.0  9.11 2.44
  SRCPARAM TARMAC3 68.1800  60.96  450.0  11.03 4.57
  SRCPARAM DCRRF12 35.3800  76.20  405.4  15.86 3.66
  SRCPARAM DCRRF34 35.3800  76.20  405.4  15.86 3.66
```

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  SRCPARAM DCRRF5 13.2400 76.20 399.8 15.74 2.97
  SRCPARAM FPLF14 135.7000 46.00 422.0 14.63 4.27
** Baseline Sources
  SRCPARAM AOPUMP6 2.3000 8.50 735.0 5.97 0.24
  SRCPARAM AOPUMP1 0.7000 8.50 735.0 7.77 0.18
  SRCPARAM AOLIME 0.8419 0.00 327.0 7.17 1.74
  SRCPARAM TARMAC3B -60.8000 60.96 472.0 10.78 4.57
  SRCPARAM DCRRF12B -22.5000 45.72 472.0 12.20 2.74
  SRCPARAM DCRRF34B -22.5300 45.72 472.0 12.20 2.74
  SRCPARAM FPLF112 508.0100 13.72 733.0 21.34 5.49
  SRCPARAM FPLF1324 508.0100 13.29 733.0 21.34 5.49
  SRCPARAM FPLF45B -70.6000 46.00 422.0 14.63 4.27
  SRCPARAM FPLC5 51.1500 45.72 408.0 11.58 4.57
  SRCPARAM FPLC6 86.8200 45.72 408.0 14.33 4.57
  SRCPARAM FPLPE12 313.7800 104.85 416.0 18.59 4.27
  SRCPARAM FPLPE34 508.2700 104.55 408.0 19.20 5.52
  SRCPARAM FPLPE112 498.9500 15.54 733.0 21.34 5.49
  SRCPARAM FPLTP12 475.2400 121.92 408.0 19.20 5.52
  SRCPARAM RINKER12 20.1900 41.76 400.0 7.62 4.57
  SRCPARAM LCRRF 30.3700 83.80 388.5 19.81 1.88
  SRCPARAM BECHTEL 82.0000 150.90 333.2 30.50 4.88
  SRCPARAM OKEELANT 24.8100 60.67 449.8 21.25 2.44
  SRCPARAM OSCEOLA 12.2200 54.90 449.0 21.38 2.13
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00   7.00   7.00
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00   7.00   7.00
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00   7.00   7.00
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00  20.60  20.60
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00   7.00   7.00
SO BUILDHGT AOGENS    7.00   7.00   7.00   7.00   7.00   7.00
SO BUILDWID AOGENS   10.80  12.18   7.90   9.11  10.05  10.68
SO BUILDWID AOGENS   10.99  10.96  10.60  10.96  10.99  10.68
SO BUILDWID AOGENS   10.11   9.19   7.98  12.18  10.80   9.10
SO BUILDWID AOGENS   10.80  12.18   7.90   9.11  21.56  20.90
SO BUILDWID AOGENS   10.99  10.96  10.60  10.96  10.99  10.68
SO BUILDWID AOGENS   10.11   9.19   7.98  12.18  10.80   9.10
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID HPGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID CDGENS    0.00   0.00   0.00   0.00   0.00   0.00
```

```
SO BUILDWID CDGENS     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC1    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC2    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC3    0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID TARMAC3   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC3   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID TARMAC3   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF12   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF34   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID DCRRF5   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID FPLF14   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID AOLIME   0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID AOLIME    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID AOLIME    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID AOLIME    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID AOLIME    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID AOLIME    0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP6   6.25   6.25   6.25   6.25  15.00  15.00
SO BUILDWID AOPUMP6  31.58  48.40  63.75  77.16  88.23  96.62
SO BUILDWID AOPUMP6 102.07 104.42 103.60 104.42 102.07  96.62
SO BUILDWID AOPUMP6  88.23  77.16  63.75  48.40  31.58  13.80
SO BUILDWID AOPUMP6  31.58  48.40  63.75  77.16  88.23  96.62
SO BUILDWID AOPUMP6 102.07 104.42 103.60 104.42 102.07  96.62
SO BUILDWID AOPUMP6  88.23  77.16  63.75  48.40  18.77  15.30
SO BUILDHGT AOPUMP1  20.60  15.00   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP1   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP1   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP1   6.25  15.00   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP1   6.25   6.25   6.25   6.25   6.25   6.25
SO BUILDHGT AOPUMP1   6.25   6.25   6.25  20.60  20.60  20.60
SO BUILDWID AOPUMP1  17.72  21.66  63.75  77.16  88.23  96.62
SO BUILDWID AOPUMP1 102.07 104.42 103.60 104.42 102.07  96.62
SO BUILDWID AOPUMP1  88.23  77.16  63.75  48.40  31.58  13.80
SO BUILDWID AOPUMP1  31.58  21.66  63.75  77.16  88.23  96.62
SO BUILDWID AOPUMP1 102.07 104.42 103.60 104.42 102.07  96.62
SO BUILDWID AOPUMP1  88.23  77.16  63.75  17.89  17.72  15.30
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID TARMAC3B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDWID DCRRF12B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF34B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF34B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF34B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF34B  0.00   0.00   0.00   0.00   0.00   0.00
SO BUILDHGT DCRRF34B  0.00   0.00   0.00   0.00   0.00   0.00
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SO BUILDHGT DCRRF34B 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDWID DCRRF34B 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDWID DCRRF34B 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT FPLF112 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT FPLF112 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDHGT FPLF112 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDHGT FPLC6 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT FPLC6 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT FPLC6 0.00 0.00 0.00 0.00 0.00 0.00

SO BUILDHGT FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
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SO BUILDWID FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE34	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLPE112	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDWID FPLTP12	0.00	0.00	0.00	0.00	0.00	0.00
SO BUILDHGT RINKER12	0.00	0.00	0.00	0.00	0.00	0.00

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SO BUILDHGT RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID LCRRF     0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID BECHTEL   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OKEELANT  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID OSCEOLA   0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID OSCEOLA    0.00   0.00   0.00   0.00   0.00   0.00
   SRCGROUP GENS AOGENS
   SRCGROUP MDWASDAO AOGENS AOLIME AOPUMP6 AOPUMP1
   SRCGROUP PSD1INCR AOGENS HPGENS CDGENS SBROWRRF NBROWRRF
   SRCGROUP PSD1INCR TARMAC1 TARMAC2 TARMAC3 TARMAC3B DCRRF12 DCRRF34
   SRCGROUP PSD1INCR DCRRF12B DCRRF34B DCRRF5 FPLF14 FPLF45B
   SRCGROUP NAAQS AOGENS HPGENS CDGENS AOLIME AOPUMP6 AOPUMP1
   SRCGROUP NAAQS SBROWRRF NBROWRRF TARMAC1 TARMAC2 TARMAC3 DCRRF12
   SRCGROUP NAAQS DCRRF34 DCRRF5 FPLF14 FPLF112 FPLF1324 FPLC5
   SRCGROUP NAAQS FPLC6 FPLPE12 FPLPE34 FPLPE112 FPLTP12 RINKER12
   SRCGROUP NAAQS LCRRF BECHTEL OKEELANTA OSCEOLA
SO FINISHED
RE STARTING
   DISCCART 557000.0  2789000.0
   DISCCART 556600.0  2792000.0
   DISCCART 556000.0  2796000.0
   DISCCART 553000.0  2796500.0
   DISCCART 548000.0  2796500.0
   DISCCART 542700.0  2796500.0
   DISCCART 542700.0  2800000.0
   DISCCART 542700.0  2805000.0
   DISCCART 542700.0  2810000.0
   DISCCART 542000.0  2811000.0
   DISCCART 541300.0  2814000.0
   DISCCART 542700.0  2816000.0
   DISCCART 544100.0  2820000.0
   DISCCART 543500.0  2824600.0
   DISCCART 545000.0  2829000.0
   DISCCART 545700.0  2832200.0
   DISCCART 546200.0  2835700.0
   DISCCART 548600.0  2837500.0
   DISCCART 550300.0  2839000.0
   DISCCART 545000.0  2839000.0
   DISCCART 540000.0  2839000.0
   DISCCART 550500.0  2844000.0
   DISCCART 545000.0  2844000.0
   DISCCART 540000.0  2844000.0
   DISCCART 550300.0  2848600.0
   DISCCART 545000.0  2848600.0
   DISCCART 540000.0  2848600.0
   DISCCART 535600.0  2848600.0
   DISCCART 530600.0  2848600.0
   DISCCART 525600.0  2848600.0
   DISCCART 520600.0  2848600.0
   DISCCART 515600.0  2848600.0
RE FINISHED
ME STARTING
   INPUTFIL 1283987.met
   ANEMHGHT  10  METERS
   SURFDATA  12839  1987
   UAIRDATA  12844  1987
ME FINISHED
OU STARTING
   RECTABLE ALLAVE FIRST
   MAXTABLE ALLAVE  50
   PLOTFILE PERIOD PSD1INCR AO87C1I.PLT  33
   PLOTFILE PERIOD NAAQS AO87C1A.PLT  34
OU FINISHED
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**MODELOPTs: CONC   RURAL FLAT   DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
AOGENS	0	0.11610E+02	566509.0	2843411.0	0.0	3.50	608.00	0.10	11.32	YES	
HPGENS	0	0.10680E+02	571491.6	2857105.0	0.0	8.80	608.00	45.19	0.53	NO	
CDGENS	0	0.10810E+02	584959.0	2847790.0	0.0	6.40	663.00	16.50	0.91	NO	
SBROWRRF	0	0.68550E+02	579600.0	2883300.0	0.0	59.44	381.00	17.98	3.96	NO	
NBROWRRF	0	0.64000E+02	583600.0	2907600.0	0.0	58.50	381.00	18.01	3.96	NO	
TARMAC1	0	0.21140E+02	562900.0	2861700.0	0.0	60.96	465.00	12.80	2.44	NO	
TARMAC2	0	0.12890E+02	562900.0	2861700.0	0.0	60.96	422.00	9.11	2.44	NO	
TARMAC3	0	0.68180E+02	562900.0	2861700.0	0.0	60.96	450.00	11.03	4.57	NO	
DCRRF12	0	0.35380E+02	564390.0	2857390.0	0.0	76.20	405.40	15.86	3.66	NO	
DCRRF34	0	0.35380E+02	564360.0	2857390.0	0.0	76.20	405.40	15.86	3.66	NO	
DCRRF5	0	0.13240E+02	564300.0	2857400.0	0.0	76.20	399.80	15.74	2.97	NO	
FPLF14	0	0.13570E+03	580100.0	2883300.0	0.0	46.00	422.00	14.63	4.27	NO	
AOLIME	0	0.84190E+00	566466.7	2843216.5	0.0	0.00	327.00	7.17	1.74	NO	
AOPUMP6	0	0.23000E+01	566598.0	2843570.0	0.0	8.50	735.00	5.97	0.24	YES	
AOPUMP1	0	0.70000E+00	566598.0	2843531.0	0.0	8.50	735.00	7.77	0.18	YES	
TARMAC3B	0	-.60800E+02	562900.0	2861700.0	0.0	60.96	472.00	10.78	4.57	NO	
DCRRF12B	0	-.22500E+02	564390.0	2857390.0	0.0	45.72	472.00	12.20	2.74	NO	
DCRRF34B	0	-.22530E+02	564360.0	2857390.0	0.0	45.72	472.00	12.20	2.74	NO	
FPLF112	0	0.50801E+03	580100.0	2883300.0	0.0	13.72	733.00	21.34	5.49	NO	
FPLF1324	0	0.50801E+03	580100.0	2883300.0	0.0	13.29	733.00	21.34	5.49	NO	
FPLF45B	0	-.70600E+02	580100.0	2883300.0	0.0	46.00	422.00	14.63	4.27	NO	
FPLC5	0	0.51150E+02	570400.0	2834900.0	0.0	45.72	408.00	11.58	4.57	NO	
FPLC6	0	0.86820E+02	570400.0	2834900.0	0.0	45.72	408.00	14.33	4.57	NO	
FPLPE12	0	0.31378E+03	587400.0	2875300.0	0.0	104.85	416.00	18.59	4.27	NO	
FPLPE34	0	0.50827E+03	587400.0	2875300.0	0.0	104.55	408.00	19.20	5.52	NO	
FPLPE112	0	0.49895E+03	587400.0	2875300.0	0.0	15.54	733.00	21.34	5.49	NO	
FPLTP12	0	0.47524E+03	567200.0	2831200.0	0.0	121.92	408.00	19.20	5.52	NO	
RINKER12	0	0.20190E+02	558200.0	2851300.0	0.0	41.76	400.00	7.62	4.57	NO	
LCRRF	0	0.30370E+02	424000.0	2946000.0	0.0	83.80	388.50	19.81	1.88	NO	
BECHTEL	0	0.82000E+02	545600.0	2991500.0	0.0	150.90	333.20	30.50	4.88	NO	
OKEELANT	0	0.24810E+02	525000.0	2939400.0	0.0	60.67	449.80	21.25	2.44	NO	
OSCEOLA	0	0.12220E+02	544200.0	2968000.0	0.0	54.90	449.00	21.38	2.13	NO	

**MODELOPTs: CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID SOURCE IDs
GENS AOGENS ,
MDWASDAO AOGENS , AOLIME , AOPUMP6 , AOPUMP1 ,
PSD1INCR AOGENS , HPGENS , CDGENS , SBROWRRF, NBROWRRF, TARMAC1 , TARMAC2 , TARMAC3 , DCRRF12 , DCRRF34 , DCRRF5 , FPLF14 ,
TARMAC3B, DCRRF12B, DCRRF34B, FPLF45B ,
NAAQS AOGENS , HPGENS , CDGENS , SBROWRRF, NBROWRRF, TARMAC1 , TARMAC2 , TARMAC3 , DCRRF12 , DCRRF34 , DCRRF5 , FPLF14 ,
AOLIME , AOPUMP6 , AOPUMP1 , FPLF112 , FPLF1324, FPLC5 , FPLC6 , FPLPE12 , FPLPE34 , FPLPE112, FPLTP12 , RINKER12,
LCRRF , BECHTEL , OKEELANT, OSCEOLA ,

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**MODELOPTs: CONC                 RURAL  FLAT       DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD ( 8760 HRS) RESULTS ***
                    ** CONC OF NO2     IN MICROGRAMS/M**3                  **

                                                         NETWORK
GROUP ID              AVERAGE CONC          RECEPTOR  (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GENS     1ST HIGHEST VALUE IS     0.39663 AT (  550500.00,  2844000.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS     0.26803 AT (  545000.00,  2844000.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS     0.25362 AT (  550300.00,  2839000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS     0.22695 AT (  550300.00,  2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS     0.20238 AT (  540000.00,  2844000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS     0.19697 AT (  548600.00,  2837500.00,     0.00,     0.00)  DC     NA

MDWASDAO 1ST HIGHEST VALUE IS     0.53689 AT (  550500.00,  2844000.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS     0.36124 AT (  545000.00,  2844000.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS     0.34205 AT (  550300.00,  2839000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS     0.31045 AT (  550300.00,  2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS     0.27217 AT (  540000.00,  2844000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS     0.26614 AT (  548600.00,  2837500.00,     0.00,     0.00)  DC     NA

PSD1INCR 1ST HIGHEST VALUE IS     0.81235 AT (  550300.00,  2848600.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS     0.80505 AT (  550500.00,  2844000.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS     0.70659 AT (  545000.00,  2848600.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS     0.67961 AT (  545000.00,  2844000.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS     0.67362 AT (  540000.00,  2848600.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS     0.62113 AT (  535600.00,  2848600.00,     0.00,     0.00)  DC     NA

NAAQS    1ST HIGHEST VALUE IS     4.49094 AT (  550300.00,  2848600.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS     4.45714 AT (  545000.00,  2848600.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS     4.21200 AT (  550500.00,  2844000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS     4.20751 AT (  540000.00,  2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS     3.87524 AT (  540000.00,  2844000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS     3.83787 AT (  550300.00,  2839000.00,     0.00,     0.00)  DC     NA
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**MODELOPTs: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8784 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)	NETWORK OF TYPE	GRID-ID
GENS	1ST HIGHEST VALUE IS	0.31174	AT	(550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.25158	AT	(550300.00, 2839000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.22588	AT	(548600.00, 2837500.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.20879	AT	(545000.00, 2839000.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.20738	AT	(545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.20551	AT	(550300.00, 2848600.00, 0.00, 0.00)	DC	NA
MDWASDAO	1ST HIGHEST VALUE IS	0.42313	AT	(550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.34430	AT	(550300.00, 2839000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.30956	AT	(548600.00, 2837500.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.28307	AT	(545000.00, 2839000.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.28087	AT	(545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.27855	AT	(550300.00, 2848600.00, 0.00, 0.00)	DC	NA
PSD1INCR	1ST HIGHEST VALUE IS	0.79420	AT	(550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.71175	AT	(550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.66112	AT	(545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.62756	AT	(540000.00, 2848600.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.61698	AT	(545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.57513	AT	(535600.00, 2848600.00, 0.00, 0.00)	DC	NA
NAAQS	1ST HIGHEST VALUE IS	4.59152	AT	(550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	4.15783	AT	(545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	4.08824	AT	(550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	3.95220	AT	(540000.00, 2848600.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	3.81653	AT	(525600.00, 2848600.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	3.74292	AT	(546200.00, 2835700.00, 0.00, 0.00)	DC	NA

```
**MODELOPTs: CONC                RURAL  FLAT      DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD ( 8760 HRS) RESULTS ***
                ** CONC OF NO2     IN MICROGRAMS/M**3                   **

                                                        NETWORK
GROUP ID              AVERAGE CONC          RECEPTOR (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GENS     1ST HIGHEST VALUE IS      0.39117 AT ( 550500.00, 2844000.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS      0.26701 AT ( 545000.00, 2844000.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS      0.25134 AT ( 550300.00, 2839000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS      0.24419 AT ( 550300.00, 2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS      0.20816 AT ( 545000.00, 2839000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS      0.20337 AT ( 540000.00, 2844000.00,     0.00,     0.00)  DC     NA

MDWASDAO 1ST HIGHEST VALUE IS      0.53640 AT ( 550500.00, 2844000.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS      0.36475 AT ( 545000.00, 2844000.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS      0.33957 AT ( 550300.00, 2839000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS      0.33238 AT ( 550300.00, 2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS      0.28223 AT ( 545000.00, 2839000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS      0.27733 AT ( 540000.00, 2844000.00,     0.00,     0.00)  DC     NA

PSD1INCR 1ST HIGHEST VALUE IS      0.68237 AT ( 550500.00, 2844000.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS      0.66263 AT ( 550300.00, 2848600.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS      0.60225 AT ( 545000.00, 2848600.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS      0.56007 AT ( 540000.00, 2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS      0.55102 AT ( 545000.00, 2844000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS      0.52132 AT ( 535600.00, 2848600.00,     0.00,     0.00)  DC     NA

NAAQS    1ST HIGHEST VALUE IS      3.81673 AT ( 550300.00, 2848600.00,     0.00,     0.00)  DC     NA
         2ND HIGHEST VALUE IS      3.75180 AT ( 545000.00, 2848600.00,     0.00,     0.00)  DC     NA
         3RD HIGHEST VALUE IS      3.68789 AT ( 550500.00, 2844000.00,     0.00,     0.00)  DC     NA
         4TH HIGHEST VALUE IS      3.26835 AT ( 540000.00, 2848600.00,     0.00,     0.00)  DC     NA
         5TH HIGHEST VALUE IS      3.26058 AT ( 550300.00, 2839000.00,     0.00,     0.00)  DC     NA
         6TH HIGHEST VALUE IS      3.10008 AT ( 530600.00, 2848600.00,     0.00,     0.00)  DC     NA
```

**MODELOPTs: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	NETWORK OF TYPE	GRID-ID
GENS	1ST HIGHEST VALUE IS	0.50796	AT (550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.37336	AT (550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.34810	AT (545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.33085	AT (550300.00, 2839000.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.30742	AT (545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.26714	AT (540000.00, 2844000.00, 0.00, 0.00)	DC	NA
MDWASDAO	1ST HIGHEST VALUE IS	0.70338	AT (550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.52382	AT (550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.47931	AT (545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.45072	AT (550300.00, 2839000.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.42570	AT (545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.36657	AT (540000.00, 2844000.00, 0.00, 0.00)	DC	NA
PSDIINCR	1ST HIGHEST VALUE IS	1.14372	AT (550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	1.11476	AT (550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.98626	AT (545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.92666	AT (540000.00, 2848600.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.89930	AT (545000.00, 2844000.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.85989	AT (540000.00, 2844000.00, 0.00, 0.00)	DC	NA
NAAQS	1ST HIGHEST VALUE IS	5.86099	AT (550500.00, 2844000.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	5.83961	AT (550300.00, 2848600.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	5.64335	AT (545000.00, 2848600.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	5.19584	AT (540000.00, 2848600.00, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	4.97338	AT (550300.00, 2839000.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	4.90050	AT (540000.00, 2844000.00, 0.00, 0.00)	DC	NA

```
**MODELOPTs: CONC                RURAL  FLAT     DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD ( 8760 HRS) RESULTS ***
** CONC OF NO2     IN MICROGRAMS/M**3                 **

                                              NETWORK
GROUP ID              AVERAGE CONC         RECEPTOR (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GENS     1ST HIGHEST VALUE IS     0.35369 AT ( 550300.00, 2848600.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS     0.34372 AT ( 550500.00, 2844000.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS     0.26406 AT ( 550300.00, 2839000.00,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS     0.25652 AT ( 545000.00, 2848600.00,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS     0.24044 AT ( 545000.00, 2844000.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS     0.20808 AT ( 545000.00, 2839000.00,    0.00,    0.00) DC    NA

MDWASDAO 1ST HIGHEST VALUE IS     0.48377 AT ( 550300.00, 2848600.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS     0.47063 AT ( 550500.00, 2844000.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS     0.35848 AT ( 550300.00, 2839000.00,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS     0.34916 AT ( 545000.00, 2848600.00,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS     0.32730 AT ( 545000.00, 2844000.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS     0.28489 AT ( 545000.00, 2839000.00,    0.00,    0.00) DC    NA

PSDIINCR 1ST HIGHEST VALUE IS     1.00032 AT ( 550300.00, 2848600.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS     0.86538 AT ( 550500.00, 2844000.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS     0.85684 AT ( 545000.00, 2848600.00,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS     0.73561 AT ( 540000.00, 2848600.00,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS     0.72889 AT ( 545000.00, 2844000.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS     0.69752 AT ( 550300.00, 2839000.00,    0.00,    0.00) DC    NA

NAAQS    1ST HIGHEST VALUE IS     5.49998 AT ( 550300.00, 2848600.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS     5.20527 AT ( 545000.00, 2848600.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS     5.12932 AT ( 550500.00, 2844000.00,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS     4.57407 AT ( 545000.00, 2844000.00,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS     4.49774 AT ( 540000.00, 2844000.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS     4.46144 AT ( 550300.00, 2839000.00,    0.00,    0.00) DC    NA
```

Appendix C

Class II Area Dispersion Model Input and Output Summaries

Alexander Orr, Jr. Water Treatment Plant

Summary of Maximum Predicted PSD Increment Consumption - NO_2
Vertical Generator Stacks and Site-Specific Emissions
Alexander Orr, Jr. WTP
Miami-Dade Water and Sewer Department

	Maximum Predicted Offsite Increment Consumption (µg/m3)				
	1987	**1988**	**1989**	**1990**	**1991**
Maximum Predicted Impact	16.16	21.35	24.09	21.30	18.28
PSD Increment	25.00	25.00	25.00	25.00	25.00
Location	(200 m, 300 deg)	(204 m, 317 deg)	(204 m, 317 deg)	(204 m, 317 deg)	(201 m, 304 deg)

Q_s = 11.61 g NOx/s standby gens hrs/yr = 14,000 (total) 40,110,000 kW-hr (total)

* PM10 emissions do not exceed PSD significant emission rates.

Summary of Maximum Predicted Ambient NO2 Concentrations - Annual Average
ISC Run 10: Vertical Generator, Pump 5, and Pump 6 Stacks (Site-Specific Emissions) and Diesel Pump Engines ("Reduced "Site-Specific Emissions)
Alexander Orr, Jr. WTP
Miami-Dade Water and Sewer Department

	Maximum Predicted Offsite Concentration (µg/m3)				
	1987	**1988**	**1989**	**1990**	**1991**
Maximum Predicted Impact	70.6	68.1	80.0	82.0	87.5
1996 Background[1]	12.0	12.0	12.0	12.0	12.0
Maximum Predicted Concentration	82.6	80.1	92.0	94.0	99.5
NAAQS	100.0	100.0	100.0	100.0	100.0
Location	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)	(195 m, 6 deg)

1 Background concentration for 1997 at Virginia Key monitoring station.

standby gens Q_s = 11.61 g NOx/s	hrs/yr = 14,000 (total)	site-specific emissions	40,110,000 kW-hr (total)
Worthington #6 Q_s = 2.30 g NOx/s	continuous	site-specific emissions	
Diesel Pumps 1, 3 & 4 Q_s = 0.70 g NOx/s	one @ 50% operation	site-specific emissions	

* PM10 emissions do not exceed significant emission rates.

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NO ECHO
CO STARTING
  TITLEONE Standby Generator Sets - NAAQS & PSD Class II Increment - NO2 - 1988
  TITLETWO Miami-Dade Water and Sewer Department Alexander Orr WTP Standby Generators
  MODELOPT DFAULT CONC RURAL
  TERRHGTS FLAT
  AVERTIME 1 PERIOD
  POLLUTID NO2
  RUNORNOT RUN
CO FINISHED
SO STARTING
** LOCATION SRC-ID TYPE UTM X (m) UTM Y (m) Z (m)
** PSD Increment Consuming Sources
  LOCATION AOGENS POINT 566509.0 2843411.0 0.00
  LOCATION HPGENS POINT 571491.6 2857105.1 0.00
  LOCATION CDGENS POINT 584959.0 2847790.0 0.00
  LOCATION SBROWRRF POINT 579600.0 2883300.0 0.00
  LOCATION NBROWRRF POINT 583600.0 2907600.0 0.00
  LOCATION TARMAC1 POINT 562900.0 2861700.0 0.00
  LOCATION TARMAC2 POINT 562900.0 2861700.0 0.00
  LOCATION TARMAC3 POINT 562900.0 2861700.0 0.00
  LOCATION DCRRF12 POINT 564390.0 2857390.0 0.00
  LOCATION DCRRF34 POINT 564360.0 2857390.0 0.00
  LOCATION DCRRF5 POINT 564300.0 2857400.0 0.00
  LOCATION FPLF14 POINT 580100.0 2883300.0 0.00
** Baseline Sources
  LOCATION AOLIME POINT 566466.7 2843216.5 0.00
  LOCATION AOPUMP6 POINT 566598.0 2843570.0 0.00
  LOCATION AOPUMP1 POINT 566598.0 2843531.0 0.00
  LOCATION TARMAC3B POINT 562900.0 2861700.0 0.00
  LOCATION DCRRF12B POINT 564390.0 2857390.0 0.00
  LOCATION DCRRF34B POINT 564360.0 2857390.0 0.00
  LOCATION FPLF112 POINT 580100.0 2883300.0 0.00
  LOCATION FPLF1324 POINT 580100.0 2883300.0 0.00
  LOCATION FPLF45B POINT 580100.0 2883300.0 0.00
  LOCATION FPLC5 POINT 570400.0 2834900.0 0.00
  LOCATION FPLC6 POINT 570400.0 2834900.0 0.00
  LOCATION FPLPE12 POINT 587400.0 2875300.0 0.00
  LOCATION FPLPE34 POINT 587400.0 2875300.0 0.00
  LOCATION FPLPE112 POINT 587400.0 2875300.0 0.00
  LOCATION FPLTP12 POINT 567200.0 2831200.0 0.00
  LOCATION RINKER12 POINT 558200.0 2851300.0 0.00
** SRCPARAM SRC-ID EMIS Hgt temp,X,sy vel,y,sz dia,ang
** PSD Increment Consuming Sources
  SRCPARAM AOGENS 11.609 4.72 608.0 45.19 0.53
  SRCPARAM HPGENS 10.6800 8.80 608.0 45.19 0.53
  SRCPARAM CDGENS 10.8100 6.40 663.0 16.50 0.91
  SRCPARAM SBROWRRF 68.5500 59.44 381.0 17.98 3.96
  SRCPARAM NBROWRRF 64.0000 58.50 381.0 18.01 3.96
  SRCPARAM TARMAC1 21.1400 60.96 465.0 12.80 2.44
  SRCPARAM TARMAC2 12.8900 60.96 422.0 9.11 2.44
  SRCPARAM TARMAC3 68.1800 60.96 450.0 11.03 4.57
  SRCPARAM DCRRF12 35.3800 76.20 405.4 15.86 3.66
  SRCPARAM DCRRF34 35.3800 76.20 405.4 15.86 3.66
  SRCPARAM DCRRF5 13.2400 76.20 399.8 15.74 2.97
  SRCPARAM FPLF14 135.7000 46.00 422.0 14.63 4.27
** Baseline Sources
  SRCPARAM AOPUMP6 2.300 8.50 735.0 5.97 0.24
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SRCPARAM AOPUMP1 0.700 8.50 735.0 7.77 0.18
SRCPARAM AOLIME 0.8419 0.00 327.0 7.17 1.74
SRCPARAM TARMAC3B -60.8000 60.96 472.0 10.78 4.57
SRCPARAM DCRRF12B -22.5000 45.72 472.0 12.20 2.74
SRCPARAM DCRRF34B -22.5300 45.72 472.0 12.20 2.74
SRCPARAM FPLF112 508.0100 13.72 733.0 21.34 5.49
SRCPARAM FPLF1324 508.0100 13.29 733.0 21.34 5.49
SRCPARAM FPLF45B -70.6000 46.00 422.0 14.63 4.27
SRCPARAM FPLC5 51.1500 45.72 408.0 11.58 4.57
SRCPARAM FPLC6 86.8200 45.72 408.0 14.33 4.57
SRCPARAM FPLPE12 313.7800 104.85 416.0 18.59 4.27
SRCPARAM FPLPE34 508.2700 104.55 408.0 19.20 5.52
SRCPARAM FPLPE112 498.9500 15.54 733.0 21.34 5.49
SRCPARAM FPLTP12 475.2400 121.92 408.0 19.20 5.52
SRCPARAM RINKER12 20.1900 41.76 400.0 7.62 4.57
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  7.00  7.00
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  7.00  7.00
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  7.00  7.00
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  20.60  20.60
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  7.00  7.00
SO BUILDHGT AOGENS    7.00  7.00  7.00  7.00  7.00  7.00
SO BUILDWID AOGENS    10.80  12.18  7.90  9.11  10.05  10.68
SO BUILDWID AOGENS    10.99  10.96  10.60  10.96  10.99  10.73
SO BUILDWID AOGENS    10.11  9.19  7.98  12.18  10.80  9.10
SO BUILDWID AOGENS    10.80  12.18  7.90  9.11  21.56  20.90
SO BUILDWID AOGENS    10.99  10.96  10.60  10.96  10.99  10.73
SO BUILDWID AOGENS    10.11  9.19  7.98  12.18  10.80  9.10
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID HPGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID CDGENS    0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDHGT SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
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```
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID SBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID NBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID NBROWRRF  0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDHGT TARMAC2  0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDHGT DCRRF12  0.00  0.00  0.00  0.00  0.00  0.00
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SO BUILDWID AOPUMP6 102.07 104.42 103.60 104.42 102.07 96.62
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SO BUILDHGT FPLF112 0.00 0.00 0.00 0.00 0.00 0.00

SO	BUILDHGT	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
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SO	BUILDWID	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF112	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF1324	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLF45B	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC5	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDHGT	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
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SO	BUILDWID	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
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SO	BUILDWID	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00
SO	BUILDWID	FPLC6	0.00	0.00	0.00	0.00	0.00	0.00

SO BUILDWID FPLC6 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT FPLPE12 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDHGT FPLPE112 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDHGT FPLTP12 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDWID FPLTP12 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDWID FPLTP12 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT RINKER12 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT RINKER12 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDHGT RINKER12 0.00 0.00 0.00 0.00 0.00 0.00
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SO BUILDWID RINKER12 0.00 0.00 0.00 0.00 0.00 0.00
SO BUILDWID RINKER12 0.00 0.00 0.00 0.00 0.00 0.00

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SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
SO BUILDWID RINKER12  0.00  0.00  0.00  0.00  0.00  0.00
  SRCGROUP GENS AOGENS
  SRCGROUP MDWASDAO AOGENS AOLIME AOPUMP6 AOPUMP1
  SRCGROUP PSD2INCR AOGENS HPGENS CDGENS SBROWRRF NBROWRRF
  SRCGROUP PSD2INCR TARMAC1 TARMAC2 TARMAC3 TARMAC3B DCRRF12 DCRRF34
  SRCGROUP PSD2INCR DCRRF12B DCRRF34B DCRRF5 FPLF14 FPLF45B
  SRCGROUP NAAQS AOGENS HPGENS CDGENS AOLIME AOPUMP6 AOPUMP1
  SRCGROUP NAAQS SBROWRRF NBROWRRF TARMAC1 TARMAC2 TARMAC3 DCRRF12
  SRCGROUP NAAQS DCRRF34 DCRRF5 FPLF14 FPLF112 FPLF1324 FPLC5
  SRCGROUP NAAQS FPLC6 FPLPE12 FPLPE34 FPLPE112 FPLTP12 RINKER12
SO FINISHED
RE STARTING
** Polar Receptor Grid
  GRIDPOLR POL1 STA
  GRIDPOLR POL1 ORIG  566509  2843411
  GRIDPOLR POL1 DIST  500  600  700  800  900
  GRIDPOLR POL1 DIST  1000  1250  1500  1750  2000
  GRIDPOLR POL1 DIST  2250  2500  3000  3500  4000
  GRIDPOLR POL1 DIST  4500  5000  6000  7000  8000
  GRIDPOLR POL1 DIST  9000
  GRIDPOLR POL1 GDIR  36  10  10
  GRIDPOLR POL1 END
RE DISCCART   566509.0  2843611.0
RE DISCCART   566682.2  2843511.0
RE DISCCART   566696.9  2843479.4
RE DISCCART   566706.0  2843445.7
RE DISCCART   566709.0  2843411.0
RE DISCCART   566706.0  2843376.3
RE DISCCART   566696.9  2843342.6
RE DISCCART   566682.2  2843311.0
RE DISCCART   566335.8  2843511.0
RE DISCCART   566509.0  2843711.0
RE DISCCART   566561.1  2843706.4
RE DISCCART   566611.6  2843692.9
RE DISCCART   566659.0  2843670.8
RE DISCCART   566701.8  2843640.8
RE DISCCART   566738.8  2843603.8
RE DISCCART   566768.8  2843561.0
RE DISCCART   566790.9  2843513.6
RE DISCCART   566804.4  2843463.1
RE DISCCART   566809.0  2843411.0
RE DISCCART   566804.4  2843358.9
RE DISCCART   566790.9  2843308.4
RE DISCCART   566768.8  2843261.0
RE DISCCART   566738.8  2843218.2
RE DISCCART   566701.8  2843181.2
RE DISCCART   566659.0  2843151.2
RE DISCCART   566611.6  2843129.1
RE DISCCART   566227.1  2843513.6
RE DISCCART   566249.2  2843561.0
RE DISCCART   566279.2  2843603.8
RE DISCCART   566316.2  2843640.8
RE DISCCART   566359.0  2843670.8
RE DISCCART   566406.4  2843692.9
RE DISCCART   566456.9  2843706.4
RE DISCCART   566509.0  2843811.0
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RE DISCCART	566578.5	2843804.9
RE DISCCART	566645.8	2843786.9
RE DISCCART	566709.0	2843757.4
RE DISCCART	566766.1	2843717.4
RE DISCCART	566815.4	2843668.1
RE DISCCART	566855.4	2843611.0
RE DISCCART	566884.9	2843547.8
RE DISCCART	566902.9	2843480.5
RE DISCCART	566909.0	2843411.0
RE DISCCART	566902.9	2843341.5
RE DISCCART	566884.9	2843274.2
RE DISCCART	566855.4	2843211.0
RE DISCCART	566815.4	2843153.9
RE DISCCART	566766.1	2843104.6
RE DISCCART	566709.0	2843064.6
RE DISCCART	566645.8	2843035.1
RE DISCCART	566578.5	2843017.1
RE DISCCART	566509.0	2843011.0
RE DISCCART	566251.9	2843104.6
RE DISCCART	566133.1	2843547.8
RE DISCCART	566162.6	2843611.0
RE DISCCART	566202.6	2843668.1
RE DISCCART	566251.9	2843717.4
RE DISCCART	566309.0	2843757.4
RE DISCCART	566372.2	2843786.9
RE DISCCART	566439.5	2843804.9
RE DISCCART	566087.3	2843507.8
RE DISCCART	566137.3	2843507.8
RE DISCCART	566187.3	2843507.8
RE DISCCART	566237.3	2843507.8
RE DISCCART	566287.3	2843507.8
RE DISCCART	566296.1	2843507.8
RE DISCCART	566343.3	2843524.5
RE DISCCART	566370.8	2843561.1
RE DISCCART	566392.1	2843591.6
RE DISCCART	566430.2	2843605.3
RE DISCCART	566480.2	2843605.3
RE DISCCART	566530.2	2843605.3
RE DISCCART	566580.2	2843605.3
RE DISCCART	566630.1	2843605.3
RE DISCCART	566680.1	2843605.3
RE DISCCART	566680.1	2843555.3
RE DISCCART	566680.1	2843505.3
RE DISCCART	566680.1	2843455.4
RE DISCCART	566680.1	2843405.4
RE DISCCART	566680.1	2843355.4
RE DISCCART	566680.1	2843305.4
RE DISCCART	566680.1	2843255.4
RE DISCCART	566680.1	2843221.3
RE DISCCART	566644.2	2843185.9
RE DISCCART	566608.2	2843150.6
RE DISCCART	566572.2	2843115.2
RE DISCCART	566536.3	2843079.9
RE DISCCART	566500.3	2843044.5
RE DISCCART	566464.3	2843009.2
RE DISCCART	566428.4	2842973.8
RE DISCCART	566392.4	2842938.4
RE DISCCART	566356.5	2842903.1

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RE DISCCART  566320.5  2842867.7
RE DISCCART  566284.5  2842832.4
RE DISCCART  566248.6  2842797.0
RE DISCCART  566212.6  2842761.7
RE DISCCART  566176.6  2842726.3
RE DISCCART  566140.7  2842691.0
RE DISCCART  566140.7  2842724.5
RE DISCCART  566176.6  2842759.8
RE DISCCART  566212.6  2842795.2
RE DISCCART  566248.6  2842830.5
RE DISCCART  566284.5  2842865.9
RE DISCCART  566290.0  2842923.2
RE DISCCART  566290.0  2842973.2
RE DISCCART  566290.0  2843023.2
RE DISCCART  566290.0  2843073.2
RE DISCCART  566290.0  2843123.1
RE DISCCART  566240.0  2843123.8
RE DISCCART  566190.0  2843123.8
RE DISCCART  566140.1  2843123.8
RE DISCCART  566090.1  2843123.8
RE DISCCART  566087.3  2843173.7
RE DISCCART  566087.3  2843223.7
RE DISCCART  566087.3  2843273.7
RE DISCCART  566087.3  2843323.7
RE DISCCART  566087.3  2843373.7
RE DISCCART  566087.3  2843423.7
RE DISCCART  566087.3  2843473.6
RE FINISHED
ME STARTING
  INPUTFIL 1283988.met
  ANEMHGHT  10  METERS
  SURFDATA  12839  1988
  UAIRDATA  12844  1988
ME FINISHED
OU STARTING
  RECTABLE ALLAVE FIRST
  MAXTABLE ALLAVE  50
  PLOTFILE PERIOD PSD2INCR AO88INCR.PLT  33
  PLOTFILE PERIOD NAAQS AO88AMBI.PLT  34
OU FINISHED
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**MODELOPTs: CONC RURAL FLAT DFAULT

*** POINT SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	STACK HEIGHT (METERS)	STACK TEMP. (DEG.K)	STACK EXIT VEL. (M/SEC)	STACK DIAMETER (METERS)	BUILDING EXISTS	EMISSION RATE SCALAR VARY BY
AOGENS	0	0.11609E+02	566509.0	2843411.0	0.0	4.72	608.00	45.19	0.53	YES	
HPGENS	0	0.10680E+02	571491.6	2857105.0	0.0	8.80	608.00	45.19	0.53	NO	
CDGENS	0	0.10810E+02	584959.0	2847790.0	0.0	6.40	663.00	16.50	0.91	NO	
SBROWRRF	0	0.68550E+02	579600.0	2883300.0	0.0	59.44	381.00	17.98	3.96	NO	
NBROWRRF	0	0.64000E+02	583600.0	2907600.0	0.0	58.50	381.00	18.01	3.96	NO	
TARMAC1	0	0.21140E+02	562900.0	2861700.0	0.0	60.96	465.00	12.80	2.44	NO	
TARMAC2	0	0.12890E+02	562900.0	2861700.0	0.0	60.96	422.00	9.11	2.44	NO	
TARMAC3	0	0.68180E+02	562900.0	2861700.0	0.0	60.96	450.00	11.03	4.57	NO	
DCRRF12	0	0.35380E+02	564390.0	2857390.0	0.0	76.20	405.40	15.86	3.66	NO	
DCRRF34	0	0.35380E+02	564360.0	2857390.0	0.0	76.20	405.40	15.86	3.66	NO	
DCRRF5	0	0.13240E+02	564300.0	2857400.0	0.0	76.20	399.80	15.74	2.97	NO	
FPLF14	0	0.13570E+03	580100.0	2883300.0	0.0	46.00	422.00	14.63	4.27	NO	
AOLIME	0	0.84190E+00	566466.7	2843216.5	0.0	0.00	327.00	7.17	1.74	NO	
AOPUMP6	0	0.23000E+01	566598.0	2843570.0	0.0	8.50	735.00	5.97	0.24	YES	
AOPUMP1	0	0.70000E+00	566598.0	2843531.0	0.0	8.50	735.00	7.77	0.18	YES	
TARMAC3B	0	-.60800E+02	562900.0	2861700.0	0.0	60.96	472.00	10.78	4.57	NO	
DCRRF12B	0	-.22500E+02	564390.0	2857390.0	0.0	45.72	472.00	12.20	2.74	NO	
DCRRF34B	0	-.22530E+02	564360.0	2857390.0	0.0	45.72	472.00	12.20	2.74	NO	
FPLF112	0	0.50801E+03	580100.0	2883300.0	0.0	13.72	733.00	21.34	5.49	NO	
FPLF1324	0	0.50801E+03	580100.0	2883300.0	0.0	13.29	733.00	21.34	5.49	NO	
FPLF45B	0	-.70600E+02	580100.0	2883300.0	0.0	46.00	422.00	14.63	4.27	NO	
FPLC5	0	0.51150E+02	570400.0	2834900.0	0.0	45.72	408.00	11.58	4.57	NO	
FPLC6	0	0.86820E+02	570400.0	2834900.0	0.0	45.72	408.00	14.33	4.57	NO	
FPLPE12	0	0.31378E+03	587400.0	2875300.0	0.0	104.85	416.00	18.59	4.27	NO	
FPLPE34	0	0.50827E+03	587400.0	2875300.0	0.0	104.55	408.00	19.20	5.52	NO	
FPLPE112	0	0.49895E+03	587400.0	2875300.0	0.0	15.54	733.00	21.34	5.49	NO	
FPLTP12	0	0.47524E+03	567200.0	2831200.0	0.0	121.92	408.00	19.20	5.52	NO	
RINKER12	0	0.20190E+02	558200.0	2851300.0	0.0	41.76	400.00	7.62	4.57	NO	

**MODELOPTs: CONC RURAL FLAT DFAULT

*** SOURCE IDs DEFINING SOURCE GROUPS ***

GROUP ID SOURCE IDs

GENS AOGENS ,
MDWASDAO AOGENS , AOLIME , AOPUMP6 , AOPUMP1 ,
PSD2INCR AOGENS , HPGENS , CDGENS , SBROWRRF, NBROWRRF, TARMAC1 , TARMAC2 , TARMAC3 , DCRRF12 , DCRRF34 , DCRRF5 , FPLF14 ,
TARMAC3B, DCRRF12B, DCRRF34B, FPLF45B ,
NAAQS AOGENS , HPGENS , CDGENS , SBROWRRF, NBROWRRF, TARMAC1 , TARMAC2 , TARMAC3 , DCRRF12 , DCRRF34 , DCRRF5 , FPLF14 ,
AOLIME , AOPUMP6 , AOPUMP1 , FPLF112 , FPLF1324, FPLC5 , FPLC6 , FPLPE12 , FPLPE34 , FPLPE112, FPLTP12 , RINKER12,

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**MODELOPTs: CONC                RURAL  FLAT       DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD ( 8760 HRS) RESULTS ***
** CONC OF NO2      IN MICROGRAMS/M**3                 **

                                                   NETWORK
GROUP ID              AVERAGE CONC          RECEPTOR (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GENS     1ST HIGHEST VALUE IS    20.98438 AT ( 566335.81, 2843511.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS    20.01304 AT ( 566343.31, 2843524.50,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS    19.08038 AT ( 566087.31, 2843173.75,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS    18.44399 AT ( 566076.00, 2843161.00,    0.00,    0.00) GP    POL1
         5TH HIGHEST VALUE IS    18.32905 AT ( 566370.81, 2843561.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS    16.80939 AT ( 566087.31, 2843223.75,    0.00,    0.00) DC    NA

MDWASDAO 1ST HIGHEST VALUE IS    90.73807 AT ( 566530.19, 2843605.25,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS    75.41781 AT ( 566509.00, 2843611.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS    67.94016 AT ( 566480.19, 2843605.25,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS    64.33329 AT ( 566580.19, 2843605.25,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS    62.05401 AT ( 566370.81, 2843561.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS    58.01125 AT ( 566392.13, 2843591.50,    0.00,    0.00) DC    NA

PSD2INCR 1ST HIGHEST VALUE IS    21.54760 AT ( 566335.81, 2843511.00,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS    20.57691 AT ( 566343.31, 2843524.50,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS    19.62263 AT ( 566087.31, 2843173.75,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS    18.98523 AT ( 566076.00, 2843161.00,    0.00,    0.00) GP    POL1
         5TH HIGHEST VALUE IS    18.89526 AT ( 566370.81, 2843561.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS    17.35596 AT ( 566296.13, 2843507.75,    0.00,    0.00) DC    NA

NAAQS    1ST HIGHEST VALUE IS    94.06667 AT ( 566530.19, 2843605.25,    0.00,    0.00) DC    NA
         2ND HIGHEST VALUE IS    78.74450 AT ( 566509.00, 2843611.00,    0.00,    0.00) DC    NA
         3RD HIGHEST VALUE IS    71.26543 AT ( 566480.19, 2843605.25,    0.00,    0.00) DC    NA
         4TH HIGHEST VALUE IS    67.66631 AT ( 566580.19, 2843605.25,    0.00,    0.00) DC    NA
         5TH HIGHEST VALUE IS    65.37670 AT ( 566370.81, 2843561.00,    0.00,    0.00) DC    NA
         6TH HIGHEST VALUE IS    61.33327 AT ( 566392.13, 2843591.50,    0.00,    0.00) DC    NA
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**MODELOPTs: CONC RURAL FLAT DFAULT

*** THE SUMMARY OF MAXIMUM PERIOD (8784 HRS) RESULTS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC		RECEPTOR (XR, YR, ZELEV, ZFLAG)				OF TYPE	NETWORK GRID-ID
GENS	1ST HIGHEST VALUE IS	27.91221	AT (	566370.81,	2843561.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	24.91000	AT (	566343.31,	2843524.50,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	23.44207	AT (	566335.81,	2843511.00,	0.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	22.47340	AT (	566392.13,	2843591.50,	0.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	17.56635	AT (	566087.31,	2843223.75,	0.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	17.43072	AT (	566296.13,	2843507.75,	0.00,	0.00)	DC	NA
MDWASDAO	1ST HIGHEST VALUE IS	87.37891	AT (	566530.19,	2843605.25,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	74.43353	AT (	566509.00,	2843611.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	73.40788	AT (	566580.19,	2843605.25,	0.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	71.18641	AT (	566480.19,	2843605.25,	0.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	70.53777	AT (	566370.81,	2843561.00,	0.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	66.05083	AT (	566392.13,	2843591.50,	0.00,	0.00)	DC	NA
PSD2INCR	1ST HIGHEST VALUE IS	28.46415	AT (	566370.81,	2843561.00,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	25.45852	AT (	566343.31,	2843524.50,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	23.98943	AT (	566335.81,	2843511.00,	0.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	23.02832	AT (	566392.13,	2843591.50,	0.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	18.09120	AT (	566087.31,	2843223.75,	0.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	17.97602	AT (	566296.13,	2843507.75,	0.00,	0.00)	DC	NA
NAAQS	1ST HIGHEST VALUE IS	90.85085	AT (	566530.19,	2843605.25,	0.00,	0.00)	DC	NA
	2ND HIGHEST VALUE IS	77.90646	AT (	566509.00,	2843611.00,	0.00,	0.00)	DC	NA
	3RD HIGHEST VALUE IS	76.87899	AT (	566580.19,	2843605.25,	0.00,	0.00)	DC	NA
	4TH HIGHEST VALUE IS	74.66084	AT (	566480.19,	2843605.25,	0.00,	0.00)	DC	NA
	5TH HIGHEST VALUE IS	74.02288	AT (	566370.81,	2843561.00,	0.00,	0.00)	DC	NA
	6TH HIGHEST VALUE IS	69.53291	AT (	566392.13,	2843591.50,	0.00,	0.00)	DC	NA

```
**MODELOPTs: CONC                RURAL FLAT      DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD ( 8760 HRS) RESULTS ***
                  ** CONC OF NO2    IN MICROGRAMS/M**3                  **

                                                      NETWORK
GROUP ID              AVERAGE CONC          RECEPTOR (XR, YR, ZELEV, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

GENS     1ST HIGHEST VALUE IS     31.62092 AT ( 566370.81, 2843561.00,     0.00,     0.00)  DC    NA
         2ND HIGHEST VALUE IS     28.59088 AT ( 566392.13, 2843591.50,     0.00,     0.00)  DC    NA
         3RD HIGHEST VALUE IS     26.23422 AT ( 566343.31, 2843524.50,     0.00,     0.00)  DC    NA
         4TH HIGHEST VALUE IS     23.33452 AT ( 566335.81, 2843511.00,     0.00,     0.00)  DC    NA
         5TH HIGHEST VALUE IS     19.98215 AT ( 566430.19, 2843605.25,     0.00,     0.00)  DC    NA
         6TH HIGHEST VALUE IS     19.41023 AT ( 566316.19, 2843640.75,     0.00,     0.00)  DC    NA

MDWASDAO 1ST HIGHEST VALUE IS    103.44646 AT ( 566530.19, 2843605.25,     0.00,     0.00)  DC    NA
         2ND HIGHEST VALUE IS     90.37400 AT ( 566580.19, 2843605.25,     0.00,     0.00)  DC    NA
         3RD HIGHEST VALUE IS     84.34653 AT ( 566509.00, 2843611.00,     0.00,     0.00)  DC    NA
         4TH HIGHEST VALUE IS     76.69328 AT ( 566480.19, 2843605.25,     0.00,     0.00)  DC    NA
         5TH HIGHEST VALUE IS     70.44548 AT ( 566392.13, 2843591.50,     0.00,     0.00)  DC    NA
         6TH HIGHEST VALUE IS     70.25420 AT ( 566370.81, 2843561.00,     0.00,     0.00)  DC    NA

PSD2INCR 1ST HIGHEST VALUE IS     32.12523 AT ( 566370.81, 2843561.00,     0.00,     0.00)  DC    NA
         2ND HIGHEST VALUE IS     29.09702 AT ( 566392.13, 2843591.50,     0.00,     0.00)  DC    NA
         3RD HIGHEST VALUE IS     26.73641 AT ( 566343.31, 2843524.50,     0.00,     0.00)  DC    NA
         4TH HIGHEST VALUE IS     23.83594 AT ( 566335.81, 2843511.00,     0.00,     0.00)  DC    NA
         5TH HIGHEST VALUE IS     20.48968 AT ( 566430.19, 2843605.25,     0.00,     0.00)  DC    NA
         6TH HIGHEST VALUE IS     19.91731 AT ( 566316.19, 2843640.75,     0.00,     0.00)  DC    NA

NAAQS    1ST HIGHEST VALUE IS    106.70565 AT ( 566530.19, 2843605.25,     0.00,     0.00)  DC    NA
         2ND HIGHEST VALUE IS     93.63195 AT ( 566580.19, 2843605.25,     0.00,     0.00)  DC    NA
         3RD HIGHEST VALUE IS     87.60663 AT ( 566509.00, 2843611.00,     0.00,     0.00)  DC    NA
         4TH HIGHEST VALUE IS     79.95459 AT ( 566480.19, 2843605.25,     0.00,     0.00)  DC    NA
         5TH HIGHEST VALUE IS     73.71237 AT ( 566392.13, 2843591.50,     0.00,     0.00)  DC    NA
         6TH HIGHEST VALUE IS     73.52253 AT ( 566370.81, 2843561.00,     0.00,     0.00)  DC    NA
```

**MODELOPTs: CONC RURAL FLAT DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***
** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
GENS	1ST HIGHEST VALUE IS	27.69213	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	23.50769	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	21.27429	AT (566335.81, 2843511.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	20.96180	AT (566087.31, 2843173.75, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	20.58141	AT (566076.00, 2843161.00, 0.00, 0.00)	GP	POL1
	6TH HIGHEST VALUE IS	19.90578	AT (566090.13, 2843123.75, 0.00, 0.00)	DC	NA
MDWASDAO	1ST HIGHEST VALUE IS	105.65733	AT (566530.19, 2843605.25, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	87.20940	AT (566509.00, 2843611.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	78.04527	AT (566480.19, 2843605.25, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	77.57221	AT (566580.19, 2843605.25, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	68.33600	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	66.91864	AT (566430.19, 2843605.25, 0.00, 0.00)	DC	NA
PSD2INCR	1ST HIGHEST VALUE IS	28.39977	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	24.21428	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	21.98047	AT (566335.81, 2843511.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	21.64938	AT (566087.31, 2843173.75, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	21.26795	AT (566076.00, 2843161.00, 0.00, 0.00)	GP	POL1
	6TH HIGHEST VALUE IS	20.59098	AT (566090.13, 2843123.75, 0.00, 0.00)	DC	NA
NAAQS	1ST HIGHEST VALUE IS	109.26910	AT (566530.19, 2843605.25, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	90.82682	AT (566509.00, 2843611.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	81.67031	AT (566480.19, 2843605.25, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	81.17086	AT (566580.19, 2843605.25, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	71.98673	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	70.55707	AT (566430.19, 2843605.25, 0.00, 0.00)	DC	NA

**MODELOPTs: CONC RURAL FLAT DFAULT
*** THE SUMMARY OF MAXIMUM PERIOD (8760 HRS) RESULTS ***
** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	NETWORK OF TYPE	GRID-ID
GENS	1ST HIGHEST VALUE IS	23.50998	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	23.19258	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	21.16960	AT (566335.81, 2843511.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	19.87491	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	19.70750	AT (566140.13, 2843123.75, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	19.53875	AT (566090.13, 2843123.75, 0.00, 0.00)	DC	NA
MDWASDAO	1ST HIGHEST VALUE IS	112.26685	AT (566530.19, 2843605.25, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	94.52594	AT (566509.00, 2843611.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	89.95372	AT (566580.19, 2843605.25, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	81.39127	AT (566480.19, 2843605.25, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	65.55358	AT (566430.19, 2843605.25, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	60.44089	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA
PSD2INCR	1ST HIGHEST VALUE IS	24.36688	AT (566370.81, 2843561.00, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	24.04783	AT (566343.31, 2843524.50, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	22.02442	AT (566335.81, 2843511.00, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	20.73294	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	20.53791	AT (566140.13, 2843123.75, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	20.36423	AT (566090.13, 2843123.75, 0.00, 0.00)	DC	NA
NAAQS	1ST HIGHEST VALUE IS	116.70085	AT (566530.19, 2843605.25, 0.00, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	98.96281	AT (566509.00, 2843611.00, 0.00, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	94.37961	AT (566580.19, 2843605.25, 0.00, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	85.83397	AT (566480.19, 2843605.25, 0.00, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	70.00428	AT (566430.19, 2843605.25, 0.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	64.89906	AT (566392.13, 2843591.50, 0.00, 0.00)	DC	NA

APPENDIX D

Summary of Level I Visibility Screening Analysis

Total			1663		
Calms			1		

Dispersion Condition	Sigmaz*u (m/s)	Transport time (hrs)	# of Hours	Frequency	Cumulative Freqncy
F, 1	64.85569763	6.9444	2	0.00120	0.00120
E, 1	118.8731308	6.9444	2	0.00120	0.00241
F, 2	129.7113953	3.4722	1	0.00060	0.00301
F, 3	194.5670929	2.3148	1	0.00060	0.00361
D, 1	226.5448761	6.9444	9	0.00541	0.00902
E, 2	237.7462616	3.4722	8	0.00481	0.01383
E, 3	356.6193848	2.3148	6	0.00361	0.01744
D, 2	453.0897522	3.4722	34	0.02044	0.03788
E, 4	475.4925232	1.7361	3	0.00180	0.03969
E, 5	594.3656616	1.3889	1	0.00060	0.04029
D, 3	679.6346436	2.3148	74	0.04450	0.08479
D, 4	906.1795044	1.7361	112	0.06735	0.15213
D, 5	1132.724365	1.3889	211	0.12688	0.27901
C, 1	1161.33728	6.9444	12	0.00722	0.28623
D, 6	1359.269287	1.1574	273	0.16416	0.45039
D, 7	1585.814087	0.9921	216	0.12989	0.58028
D, 8	1812.359009	0.8681	119	0.07156	0.65183
D, 9	2038.903931	0.7716	54	0.03247	0.68431
D, 10	2265.44873	0.6944	39	0.02345	0.70776
C, 2	2322.674561	3.4722	27	0.01624	0.72399
C, 3	3484.011719	2.3148	48	0.02886	0.75286
B, 1	3735.082031	6.9444	9	0.00541	0.75827
C, 4	4645.349121	1.7361	133	0.07998	0.83824
C, 5	5806.686523	1.3889	115	0.06915	0.90740
C, 6	6968.023438	1.1574	27	0.01624	0.92363
B, 2	7470.164063	3.4722	25	0.01503	0.93867
C, 7	8129.36084	0.9921	11	0.00661	0.94528
C, 8	9290.698242	0.8681	4	0.00241	0.94768
B, 3	11205.24609	2.3148	49	0.02946	0.97715
C, 10	11613.37305	0.6944	1	0.00060	0.97775
B, 4	14940.32813	1.7361	23	0.01383	0.99158
B, 5	18675.41016	1.3889	3	0.00180	0.99339
A, 1	412849.875	6.9444	1	0.00060	0.99399
A, 2	825699.75	3.4722	9	0.00541	0.99940

Visual Effects Level 2 Analysis
Source: Alexander Orr Gens
Class I Area: Everglades NP

*** User-selected Screening Scenario Results ***
Input Emissions for

Particulates	.70	g/s
NOx (as NO2)	29.00	g/s
Primary NO2	.00	g/s
Soot	.00	g/s
Primary SO4	.00	g/s

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone	.06	ppm	Spring
Background Visual Range:	47.00	km	Spring
Source-Observer Distance:	43.00	km	
Min. Source-Class I Distance:	16.75	km	
Max. Source-Class I Distance:	110.50	km	
Plume-Source-Observer Angle:	11.25	degrees	
Stability:	5		
Wind Speed:	2.00	m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	50.	37.6	119.	2.00	.743	.05	-.003
SKY	140.	50.	37.6	119.	2.00	.281	.05	-.003
TERRAIN	10.	40.	35.4	129.	2.00	.209	.05	.001
TERRAIN	140.	40.	35.4	129.	2.00	.081	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	5.	13.4	164.	2.00	.246	.05	-.002
SKY	140.	5.	13.4	164.	2.00	.091	.05	-.003
TERRAIN	10.	0.	1.0	168.	2.00	.162	.05	.002
TERRAIN	140.	0.	1.0	168.	2.00	.050	.05	.002

Visual Effects Level 2 Analysis
Source: Alexander Orr Gens
Class I Area: Everglades NP

*** User-selected Screening Scenario Results ***
Input Emissions for

Particulates	.70	g/s
NOx (as NO2)	29.00	g/s
Primary NO2	.00	g/s
Soot	.00	g/s
Primary SO4	.00	g/s

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone	.04	ppm	Summer
Background Visual Range:	59.00	km	Summer
Source-Observer Distance:	43.00	km	
Min. Source-Class I Distance:	16.75	km	
Max. Source-Class I Distance:	110.50	km	
Plume-Source-Observer Angle:	11.25	degrees	
Stability:	5		
Wind Speed:	2.00	m/s	

RESULTS

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	35.	34.1	134.	2.00	.914	.05	-.003
SKY	140.	35.	34.1	134.	2.00	.369	.05	-.004
TERRAIN	10.	30.	32.6	139.	2.00	.300	.05	.002
TERRAIN	140.	30.	32.6	139.	2.00	.125	.05	.002

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	5.	13.4	164	2.00	.476	.05	-.004
SKY	140.	5.	13.4	164.	2.00	.188	.05	-.005
TERRAIN	10.	0.	1.0	168.	2.00	.285	.05	.004
TERRAIN	140.	0.	1.0	168.	2.00	.091	.05	.004

Visual Effects Level 2 Analysis
Source: Alexander Orr Gens
Class I Area: Everglades NP

*** User-selected Screening Scenario Results ***
Input Emissions for

Particulates	.70	g/s
NOx (as NO2)	29.00	g/s
Primary NO2	.00	g/s
Soot	.00	g/s
Primary SO4	.00	g/s

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone	.05	ppm	Autumn
Background Visual Range:	63.00	km	Autumn
Source-Observer Distance:	43.00	km	
Min. Source-Class I Distance:	16.75	km	
Max. Source-Class I Distance:	110.50	km	
Plume-Source-Observer Angle:	11.25	degrees	
Stability:	5		
Wind Speed:	2.00	m/s	

RESULTS

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	35.	34.1	134.	2.00	.968	.05	-.003
SKY	140.	35.	34.1	134.	2.00	.399	.05	-.005
TERRAIN	10.	25.	30.7	144.	2.00	.333	.05	.002
TERRAIN	140.	25.	30.7	144.	2.00	.142	.05	.002

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	5.	13.4	164.	2.00	.560	.05	-.004
SKY	140.	5.	13.4	164.	2.00	.226	.05	-.005
TERRAIN	10.	0.	1.0	168.	2.00	.351	.05	.005
TERRAIN	140.	0.	1.0	168.	2.00	.115	.05	.005

Visual Effects Level 2 Analysis
Source: Alexander Orr Gens
Class I Area: Everglades NP

*** User-selected Screening Scenario Results ***
Input Emissions for

Particulates	.70	g/s
NOx (as NO2)	29.00	g/s
Primary NO2	.00	g/s
Soot	.00	g/s
Primary SO4	.00	g/s

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone	.05	ppm	Winter
Background Visual Range:	43.00	km	Winter
Source-Observer Distance:	43.00	km	
Min. Source-Class I Distance:	16.75	km	
Max. Source-Class I Distance:	110.50	km	
Plume-Source-Observer Angle:	11.25	degrees	
Stability:	5		
Wind Speed:	2.00	m/s	

RESULTS

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	60.	39.3	109.	2.00	.681	.05	-.002
SKY	140.	60.	39.3	109	2.00	.252	.05	-.003
TERRAIN	10.	45.	36.6	124.	2.00	.178	.05	.001
TERRAIN	140.	45.	36.6	124.	2.00	.068	.05	.001

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	5.	13.4	164.	2.00	.182	.05	-.002
SKY	140.	5.	13.4	164.	2.00	.066	.05	-.002
TERRAIN	10.	0.	1.0	168.	2.00	.112	.05	.002
TERRAIN	140.	0.	1.0	168.	2.00	.034	.05	.002

```
"Alexander Orr Gens.     "
"Everglades NP          "
  1   1
   .700   29.000    .000     .000     .000
  43.000   16.250   110.500   47.000
  0    1.500   3
  0    2.500   8
  0    2.500   6
  0    2.000   1
  0    1.500   4
  0     .061    2.000    5
  0   11.250
34
 1 0     5.0 163.8  13.4  30.0   35.6  .75  .050  2.00   .25  2.00   .09  2.00   .12  2.00   .05
 2 1    10.0 158.8  20.6  23.1   30.6 1.17  .050  2.00   .39  2.00   .15  2.00   .14  2.00   .05
 3 1    15.0 153.8  25.2  19.0   27.0 1.55  .050  2.00   .51  2.00   .19  2.00   .16  2.00   .06
 4 1    20.0 148.8  28.3  16.2   24.4 1.90  .050  2.00   .60  2.00   .22  2.00   .18  2.00   .07
 5 1    25.0 143.8  30.7  14.2   22.3 2.23  .050  2.00   .66  2.00   .25  2.00   .19  2.00   .08
 6 1    30.0 138.8  32.6  12.7   20.7 2.54  .050  2.00   .70  2.00   .26  2.00   .20  2.00   .08
 7 1    35.0 133.8  34.1  11.6   19.5 2.83  .050  2.00   .72  2.00   .27  2.00   .21  2.00   .08
 8 1    40.0 128.8  35.4  10.8   18.6 3.10  .050  2.00   .73  2.00   .28  2.00   .21  2.00   .08
 9 1    45.0 123.8  36.6  10.1   17.8 3.34  .050  2.00   .74  2.00   .28  2.00   .21  2.00   .08
10 1    50.0 118.8  37.6   9.6   17.3 3.55  .050  2.00   .74  2.00   .28  2.00   .21  2.00   .08
11 1    55.0 113.8  38.5   9.2   16.9 3.74  .050  2.00   .74  2.00   .28  2.00   .20  2.00   .08
12 1    60.0 108.8  39.3   8.9   16.6 3.90  .050  2.00   .74  2.00   .28  2.00   .20  2.00   .08
13 1    65.0 103.8  40.1   8.6   16.5 4.03  .050  2.00   .74  2.00   .28  2.00   .19  2.00   .07
14 1    70.0  98.8  40.9   8.5   16.5 4.12  .050  2.00   .73  2.00   .28  2.00   .19  2.00   .07
15 1    75.0  93.8  41.6   8.4   16.6 4.19  .050  2.00   .73  2.00   .28  2.00   .18  2.00   .07
16 1    80.0  88.8  42.4   8.4   16.9 4.22  .050  2.00   .73  2.00   .28  2.00   .17  2.00   .07
17 1    85.0  83.8  43.1   8.4   17.3 4.22  .050  2.00   .72  2.00   .27  2.00   .16  2.00   .06
18 1    90.0  78.8  43.8   8.6   17.8 4.19  .050  2.00   .72  2.00   .27  2.00   .15  2.00   .06
19 1    95.0  73.8  44.6   8.7   18.6 4.13  .050  2.00   .71  2.00   .27  2.00   .14  2.00   .06
20 1   100.0  68.8  45.4   9.0   19.5 4.03  .050  2.00   .70  2.00   .27  2.00   .13  2.00   .05
21 1   105.0  63.8  46.3   9.4   20.7 3.90  .050  2.00   .70  2.00   .26  2.00   .11  2.00   .04
22 1   110.0  58.8  47.3   9.8   22.3 3.75  .050  2.00   .68  2.00   .26  2.00   .10  2.00   .04
23 1   115.0  53.8  48.3  10.4   24.4 3.56  .050  2.00   .67  2.00   .25  2.00   .08  2.00   .03
24 1   120.0  48.8  49.5  11.2   27.0 3.35  .050  2.00   .65  2.00   .24  2.00   .06  2.00   .02
25 1   125.0  43.8  50.9  12.1   30.6 3.11  .050  2.00   .62  2.00   .23  2.00   .05  2.00   .02
26 1   130.0  38.8  52.6  13.4   35.6 2.84  .050  2.00   .57  2.00   .22  2.00   .03  2.00   .01
27 1   135.0  33.8  54.7  15.1   43.0 2.55  .050  2.00   .51  2.00   .19  2.00   .02  2.00   .01
28 1   140.0  28.8  57.5  17.4   54.7 2.25  .050  2.00   .43  2.00   .16  2.00   .01  2.00   .00
29 1   145.0  23.8  61.2  20.8   76.0 1.92  .050  2.00   .33  2.00   .12  2.00   .00  2.00   .00
30 1   150.0  18.8  66.9  26.1  126.1 1.57  .050  2.00   .20  2.00   .08  2.00   .00  2.00   .00
31 1   155.0  13.8  76.5  35.3  377.2 1.21  .050  2.00   .08  2.00   .03  2.00   .00  2.00   .00
32 0      .3 168.5   1.0  42.0   42.5  .12  .050  2.00   .11  2.00   .04  2.00   .16  2.00   .05
33 1     6.7 162.1  16.3  27.2   33.7  .90  .050  2.00   .30  2.00   .11  2.00   .13  2.00   .05
34 1   161.8   7.0 110.5  68.8   68.8  .68  .050  2.00   .01  2.00   .00  2.00   .01  2.00   .00
34
 1 0   5.000  .050 -.002  .002 -.003  .002 -.004  .002 -.005  .002  .000  .001 -.001  .001
 2 1  10.000  .050 -.002  .002 -.003  .002 -.006  .003 -.007  .003  .000  .001 -.001  .001
 3 1  15.000  .050 -.003  .002 -.003  .002 -.008  .003 -.008  .003  .000  .001 -.001  .001
 4 1  20.000  .050 -.003  .002 -.004  .002 -.009  .003 -.009  .003  .000  .001 -.001  .001
 5 1  25.000  .050 -.003  .002 -.004  .001 -.009  .003 -.010  .003  .000  .001 -.001  .001
 6 1  30.000  .050 -.003  .002 -.004  .001 -.010  .003 -.010  .003  .000  .001 -.001  .001
 7 1  35.000  .050 -.003  .001 -.004  .001 -.010  .003 -.011  .003  .000  .001 -.001  .000
 8 1  40.000  .050 -.003  .001 -.003  .001 -.010  .003 -.011  .003  .000  .001 -.001  .000
 9 1  45.000  .050 -.003  .001 -.003  .001 -.010  .003 -.011  .003  .000  .001 -.001  .000
10 1  50.000  .050 -.003  .001 -.003  .001 -.010  .003 -.011  .003  .000  .001 -.001  .000
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11 1 55.000 .050 -.003 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
12 1 60.000 .050 -.002 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
13 1 65.000 .050 -.002 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
14 1 70.000 .050 -.002 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
15 1 75.000 .050 -.002 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
16 1 80.000 .050 -.002 .001 -.003 .001 -.010 .003 -.011 .003 .000 .001 -.001 .000
17 1 85.000 .050 -.002 .001 -.003 .001 -.010 .003 -.010 .002 .000 .001 -.001 .000
18 1 90.000 .050 -.002 .001 -.003 .001 -.010 .002 -.010 .002 .000 .001 -.001 .000
19 1 95.000 .050 -.002 .001 -.003 .001 -.010 .002 -.010 .002 .000 .001 -.001 .000
20 1 100.000 .050 -.002 .001 -.003 .001 -.010 .002 -.010 .002 .000 .000 -.001 .000
21 1 105.000 .050 -.002 .001 -.003 .001 -.010 .002 -.010 .002 .000 .000 -.001 .000
22 1 110.000 .050 -.002 .001 -.003 .001 -.009 .002 -.010 .002 .000 .000 -.001 .000
23 1 115.000 .050 -.002 .001 -.003 .001 -.009 .001 -.010 .001 .000 .000 -.001 .000
24 1 120.000 .050 -.002 .001 -.003 .001 -.009 .001 -.010 .001 .000 .000 -.001 .000
25 1 125.000 .050 -.002 .001 -.003 .000 -.009 .001 -.009 .001 .000 .000 -.001 .000
26 1 130.000 .050 -.002 .000 -.003 .000 -.008 .001 -.009 .001 .000 .000 -.001 .000
27 1 135.000 .050 -.002 .000 -.003 .000 -.007 .000 -.008 .000 .000 .000 -.001 .000
28 1 140.000 .050 -.002 .000 -.003 .000 -.006 .000 -.007 .000 .000 .000 -.001 .000
29 1 145.000 .050 -.002 .000 -.002 .000 -.005 .000 -.005 .000 .000 .000 -.001 .000
30 1 150.000 .050 -.001 .000 -.002 .000 -.003 .000 -.004 .000 .000 .000 -.000 .000
31 1 155.000 .050 -.001 .000 -.001 .000 -.001 .000 -.002 .000 .000 .000 -.000 .000
32 0 .266 .050 -.001 .002 -.002 .002 -.001 .002 -.002 .002 .001 .002 -.001 .002
33 1 6.681 .050 -.002 .002 -.003 .002 -.005 .002 -.005 .002 .000 .001 -.001 .001
34 1 161.750 .050 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000 .000
"Alexander Orr Gens "
"Everglades NP "
  1  1
   .700  29.000   .000   .000   .000
  43.000  16.250  110.500  59.000
  0   1.500   3
  0   2.500   8
  0   2.500   6
  0   2.000   1
  0   1.500   4
  0    .040   2.000   5
  0  11.250
34
 1 0    5.0 163.8 13.4 30.0 35.6  .75 .050 2.00 .48 2.00 .19 2.00 .25 2.00 .10
 2 1   10.0 158.8 20.6 23.1 30.6 1.17 .050 2.00 .65 2.00 .26 2.00 .26 2.00 .11
 3 1   15.0 153.8 25.2 19.0 27.0 1.55 .050 2.00 .77 2.00 .31 2.00 .28 2.00 .12
 4 1   20.0 148.8 28.3 16.2 24.4 1.90 .050 2.00 .84 2.00 .34 2.00 .29 2.00 .12
 5 1   25.0 143.8 30.7 14.2 22.3 2.23 .050 2.00 .89 2.00 .36 2.00 .30 2.00 .13
 6 1   30.0 138.8 32.6 12.7 20.7 2.54 .050 2.00 .91 2.00 .37 2.00 .30 2.00 .13
 7 1   35.0 133.8 34.1 11.6 19.5 2.83 .050 2.00 .91 2.00 .37 2.00 .30 2.00 .12
 8 1   40.0 128.8 35.4 10.8 18.6 3.10 .050 2.00 .91 2.00 .37 2.00 .29 2.00 .12
 9 1   45.0 123.8 36.6 10.1 17.8 3.34 .050 2.00 .91 2.00 .37 2.00 .29 2.00 .12
10 1   50.0 118.8 37.6  9.6 17.3 3.55 .050 2.00 .90 2.00 .36 2.00 .28 2.00 .12
11 1   55.0 113.8 38.5  9.2 16.9 3.74 .050 2.00 .89 2.00 .36 2.00 .27 2.00 .11
12 1   60.0 108.8 39.3  8.9 16.6 3.90 .050 2.00 .88 2.00 .36 2.00 .26 2.00 .11
13 1   65.0 103.8 40.1  8.6 16.5 4.03 .050 2.00 .88 2.00 .35 2.00 .25 2.00 .11
14 1   70.0  98.8 40.9  8.5 16.5 4.12 .050 2.00 .87 2.00 .35 2.00 .24 2.00 .10
15 1   75.0  93.8 41.6  8.4 16.6 4.19 .050 2.00 .86 2.00 .35 2.00 .24 2.00 .10
16 1   80.0  88.8 42.4  8.4 16.9 4.22 .050 2.00 .86 2.00 .35 2.00 .23 2.00 .09
17 1   85.0  83.8 43.1  8.4 17.3 4.22 .050 2.00 .85 2.00 .35 2.00 .22 2.00 .09
18 1   90.0  78.8 43.8  8.6 17.8 4.19 .050 2.00 .85 2.00 .34 2.00 .21 2.00 .09
19 1   95.0  73.8 44.6  8.7 18.6 4.13 .050 2.00 .85 2.00 .34 2.00 .19 2.00 .08
20 1  100.0  68.8 45.4  9.0 19.5 4.03 .050 2.00 .84 2.00 .34 2.00 .18 2.00 .08
21 1  105.0  63.8 46.3  9.4 20.7 3.90 .050 2.00 .84 2.00 .34 2.00 .17 2.00 .07
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22 1  110.0  58.8  47.3   9.8  22.3 3.75  .050  2.00   .83  2.00   .34  2.00   .15  2.00   .06
23 1  115.0  53.8  48.3  10.4  24.4 3.56  .050  2.00   .83  2.00   .33  2.00   .13  2.00   .05
24 1  120.0  48.8  49.5  11.2  27.0 3.35  .050  2.00   .81  2.00   .33  2.00   .11  2.00   .04
25 1  125.0  43.8  50.9  12.1  30.6 3.11  .050  2.00   .79  2.00   .32  2.00   .08  2.00   .03
26 1  130.0  38.8  52.6  13.4  35.6 2.84  .050  2.00   .76  2.00   .31  2.00   .06  2.00   .02
27 1  135.0  33.8  54.7  15.1  43.0 2.55  .050  2.00   .71  2.00   .28  2.00   .03  2.00   .01
28 1  140.0  28.8  57.5  17.4  54.7 2.25  .050  2.00   .63  2.00   .25  2.00   .02  2.00   .01
29 1  145.0  23.8  61.2  20.8  76.0 1.92  .050  2.00   .52  2.00   .21  2.00   .01  2.00   .00
30 1  150.0  18.8  66.9  26.1 126.1 1.57  .050  2.00   .36  2.00   .14  2.00   .00  2.00   .00
31 1  155.0  13.8  76.5  35.3 377.2 1.21  .050  2.00   .18  2.00   .07  2.00   .00  2.00   .00
32 0     .3 168.5   1.0  42.0  42.5  .12  .050  2.00   .23  2.00   .08  2.00   .29  2.00   .09
33 1    6.7 162.1  16.3  27.2  33.7  .90  .050  2.00   .54  2.00   .21  2.00   .25  2.00   .10
34 1  161.8   7.0 110.5  68.8  68.8  .68  .050  2.00   .02  2.00   .01  2.00   .02  2.00   .01
34
 1 0   5.000  .050 -.004  .003 -.005  .003 -.008  .005 -.009  .005  .000  .001 -.001  .001
 2 1  10.000  .050 -.004  .003 -.005  .003 -.010  .005 -.011  .005  .000  .001 -.001  .001
 3 1  15.000  .050 -.004  .002 -.005  .002 -.011  .005 -.012  .005  .000  .001 -.001  .001
 4 1  20.000  .050 -.004  .002 -.005  .002 -.012  .005 -.013  .005  .000  .001 -.001  .001
 5 1  25.000  .050 -.003  .002 -.005  .002 -.013  .005 -.014  .005  .000  .001 -.001  .001
 6 1  30.000  .050 -.003  .002 -.004  .002 -.013  .005 -.014  .005  .000  .001 -.001  .001
 7 1  35.000  .050 -.003  .002 -.004  .002 -.013  .005 -.014  .004  .000  .001 -.001  .001
 8 1  40.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .001
 9 1  45.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .001
10 1  50.000  .050 -.003  .002 -.004  .001 -.012  .004 -.013  .004  .000  .001 -.001  .000
11 1  55.000  .050 -.003  .002 -.004  .001 -.012  .004 -.013  .004  .000  .001 -.001  .000
12 1  60.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .004  .000  .001 -.001  .000
13 1  65.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .004  .000  .001 -.001  .000
14 1  70.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .003  .000  .001 -.001  .000
15 1  75.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
16 1  80.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
17 1  85.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
18 1  90.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
19 1  95.000  .050 -.003  .001 -.004  .001 -.012  .003 -.012  .003  .000  .001 -.001  .000
20 1 100.000  .050 -.003  .001 -.004  .001 -.012  .003 -.012  .003  .000  .001 -.001  .000
21 1 105.000  .050 -.003  .001 -.004  .001 -.012  .003 -.012  .003  .000  .001 -.001  .000
22 1 110.000  .050 -.003  .001 -.004  .001 -.012  .002 -.012  .002  .000  .001 -.001  .000
23 1 115.000  .050 -.003  .001 -.004  .001 -.012  .002 -.012  .002  .000  .001 -.001  .000
24 1 120.000  .050 -.003  .001 -.004  .001 -.011  .002 -.012  .002  .000  .001 -.001  .000
25 1 125.000  .050 -.003  .001 -.004  .001 -.011  .001 -.012  .001  .000  .000 -.001  .000
26 1 130.000  .050 -.003  .001 -.004  .001 -.011  .001 -.012  .001  .000  .000 -.001  .000
27 1 135.000  .050 -.003  .000 -.004  .000 -.010  .001 -.011  .001  .000  .000 -.001  .000
28 1 140.000  .050 -.003  .000 -.004  .000 -.009  .000 -.010  .000  .000  .000 -.001  .000
29 1 145.000  .050 -.003  .000 -.003  .000 -.008  .000 -.008  .000  .000  .000 -.001  .000
30 1 150.000  .050 -.002  .000 -.003  .000 -.006  .000 -.006  .000  .000  .000 -.001  .000
31 1 155.000  .050 -.002  .000 -.002  .000 -.003  .000 -.003  .000  .000  .000 -.001  .000
32 0    .266  .050 -.000  .004 -.004  .004 -.003  .004 -.004  .004  .003  .004 -.002  .004
33 1   6.681  .050 -.004  .003 -.005  .003 -.009  .005 -.009  .005  .000  .001 -.001  .001
34 1 161.750  .050 -.000  .000 -.000  .000 -.000  .000 -.000  .000  .000  .000 -.000  .000
"Alexander Orr Gens     "
"Everglades NP        "
  1  1
   .700   29.000     .000     .000     .000
  43.000   16.250  110.500   63.000
  0    1.500   3
  0    2.500   8
  0    2.500   6
  0    2.000   1
  0    1.500   4
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 0    .047    2.000   5
 0   11.250
34
 1 0    5.0 163.8  13.4  30.0  35.6  .75  .050  2.00   .56  2.00   .23  2.00   .30  2.00   .12
 2 1   10.0 158.8  20.6  23.1  30.6 1.17  .050  2.00   .73  2.00   .30  2.00   .31  2.00   .13
 3 1   15.0 153.8  25.2  19.0  27.0 1.55  .050  2.00   .85  2.00   .35  2.00   .32  2.00   .14
 4 1   20.0 148.8  28.3  16.2  24.4 1.90  .050  2.00   .92  2.00   .38  2.00   .33  2.00   .14
 5 1   25.0 143.8  30.7  14.2  22.3 2.23  .050  2.00   .95  2.00   .39  2.00   .33  2.00   .14
 6 1   30.0 138.8  32.6  12.7  20.7 2.54  .050  2.00   .97  2.00   .40  2.00   .33  2.00   .14
 7 1   35.0 133.8  34.1  11.6  19.5 2.83  .050  2.00   .97  2.00   .40  2.00   .32  2.00   .14
 8 1   40.0 128.8  35.4  10.8  18.6 3.10  .050  2.00   .96  2.00   .40  2.00   .32  2.00   .13
 9 1   45.0 123.8  36.6  10.1  17.8 3.34  .050  2.00   .95  2.00   .39  2.00   .31  2.00   .13
10 1   50.0 118.8  37.6   9.6  17.3 3.55  .050  2.00   .94  2.00   .39  2.00   .30  2.00   .13
11 1   55.0 113.8  38.5   9.2  16.9 3.74  .050  2.00   .93  2.00   .38  2.00   .29  2.00   .12
12 1   60.0 108.8  39.3   8.9  16.6 3.90  .050  2.00   .92  2.00   .38  2.00   .28  2.00   .12
13 1   65.0 103.8  40.1   8.6  16.5 4.03  .050  2.00   .91  2.00   .38  2.00   .27  2.00   .11
14 1   70.0  98.8  40.9   8.5  16.5 4.12  .050  2.00   .90  2.00   .37  2.00   .26  2.00   .11
15 1   75.0  93.8  41.6   8.4  16.6 4.19  .050  2.00   .90  2.00   .37  2.00   .25  2.00   .11
16 1   80.0  88.8  42.4   8.4  16.9 4.22  .050  2.00   .89  2.00   .37  2.00   .24  2.00   .10
17 1   85.0  83.8  43.1   8.4  17.3 4.22  .050  2.00   .89  2.00   .37  2.00   .23  2.00   .10
18 1   90.0  78.8  43.8   8.6  17.8 4.19  .050  2.00   .88  2.00   .37  2.00   .22  2.00   .09
19 1   95.0  73.8  44.6   8.7  18.6 4.13  .050  2.00   .88  2.00   .36  2.00   .21  2.00   .09
20 1  100.0  68.8  45.4   9.0  19.5 4.03  .050  2.00   .88  2.00   .36  2.00   .20  2.00   .08
21 1  105.0  63.8  46.3   9.4  20.7 3.90  .050  2.00   .88  2.00   .36  2.00   .18  2.00   .08
22 1  110.0  58.8  47.3   9.8  22.3 3.75  .050  2.00   .87  2.00   .36  2.00   .16  2.00   .07
23 1  115.0  53.8  48.3  10.4  24.4 3.56  .050  2.00   .87  2.00   .36  2.00   .14  2.00   .06
24 1  120.0  48.8  49.5  11.2  27.0 3.35  .050  2.00   .86  2.00   .35  2.00   .12  2.00   .05
25 1  125.0  43.8  50.9  12.1  30.6 3.11  .050  2.00   .84  2.00   .35  2.00   .09  2.00   .04
26 1  130.0  38.8  52.6  13.4  35.6 2.84  .050  2.00   .81  2.00   .33  2.00   .07  2.00   .03
27 1  135.0  33.8  54.7  15.1  43.0 2.55  .050  2.00   .76  2.00   .31  2.00   .04  2.00   .02
28 1  140.0  28.8  57.5  17.4  54.7 2.25  .050  2.00   .69  2.00   .28  2.00   .02  2.00   .01
29 1  145.0  23.8  61.2  20.8  76.0 1.92  .050  2.00   .58  2.00   .23  2.00   .01  2.00   .00
30 1  150.0  18.8  66.9  26.1 126.1 1.57  .050  2.00   .41  2.00   .17  2.00   .00  2.00   .00
31 1  155.0  13.8  76.5  35.3 377.2 1.21  .050  2.00   .21  2.00   .09  2.00   .00  2.00   .00
32 0     .3 168.5   1.0  42.0  42.5  .12  .050  2.00   .30  2.00   .10  2.00   .35  2.00   .12
33 1    6.7 162.1  16.3  27.2  33.7  .90  .050  2.00   .62  2.00   .25  2.00   .30  2.00   .13
34 1  161.8   7.0 110.5  68.8  68.8  .68  .050  2.00   .02  2.00   .01  2.00   .03  2.00   .01
34
 1 0   5.000  .050 -.004  .004 -.005  .004 -.009  .006 -.010  .006  .000  .002 -.001  .001
 2 1  10.000  .050 -.004  .003 -.005  .003 -.011  .006 -.012  .006  .000  .001 -.001  .001
 3 1  15.000  .050 -.004  .003 -.005  .002 -.013  .006 -.014  .006  .000  .001 -.001  .001
 4 1  20.000  .050 -.004  .002 -.005  .002 -.013  .006 -.014  .005  .000  .001 -.001  .001
 5 1  25.000  .050 -.004  .002 -.005  .002 -.014  .005 -.015  .005  .000  .001 -.001  .001
 6 1  30.000  .050 -.004  .002 -.005  .002 -.014  .005 -.015  .005  .000  .001 -.001  .001
 7 1  35.000  .050 -.003  .002 -.005  .002 -.014  .005 -.015  .005  .000  .001 -.001  .001
 8 1  40.000  .050 -.003  .002 -.004  .002 -.013  .005 -.014  .005  .000  .001 -.001  .001
 9 1  45.000  .050 -.003  .002 -.004  .001 -.013  .005 -.014  .004  .000  .001 -.001  .001
10 1  50.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .000
11 1  55.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .000
12 1  60.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .000
13 1  65.000  .050 -.003  .002 -.004  .001 -.013  .004 -.014  .004  .000  .001 -.001  .000
14 1  70.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .004  .000  .001 -.001  .000
15 1  75.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .003  .000  .001 -.001  .000
16 1  80.000  .050 -.003  .001 -.004  .001 -.012  .004 -.013  .003  .000  .001 -.001  .000
17 1  85.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
18 1  90.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
19 1  95.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
20 1 100.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
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21 1 105.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
22 1 110.000  .050 -.003  .001 -.004  .001 -.012  .003 -.013  .003  .000  .001 -.001  .000
23 1 115.000  .050 -.003  .001 -.004  .001 -.012  .002 -.013  .002  .000  .001 -.001  .000
24 1 120.000  .050 -.003  .001 -.004  .001 -.012  .002 -.013  .002  .000  .001 -.001  .000
25 1 125.000  .050 -.003  .001 -.004  .001 -.012  .002 -.013  .002  .000  .001 -.001  .000
26 1 130.000  .050 -.003  .001 -.004  .001 -.012  .001 -.012  .001  .000  .000 -.001  .000
27 1 135.000  .050 -.003  .001 -.004  .000 -.011  .001 -.012  .001  .000  .000 -.001  .000
28 1 140.000  .050 -.003  .000 -.004  .000 -.010  .000 -.011  .000  .000  .000 -.001  .000
29 1 145.000  .050 -.003  .000 -.004  .000 -.009  .000 -.009  .000  .000  .000 -.001  .000
30 1 150.000  .050 -.002  .000 -.003  .000 -.007  .000 -.007  .000  .000  .000 -.001  .000
31 1 155.000  .050 -.002  .000 -.002  .000 -.004  .000 -.004  .000  .000  .000 -.001  .000
32 0    .266  .050 -.001  .005 -.005  .005 -.004  .005 -.005  .005 -.003  .005 -.002  .005
33 1   6.681  .050 -.004  .003 -.005  .003 -.010  .006 -.011  .006  .000  .002 -.001  .001
34 1 161.750  .050 -.000  .000 -.000  .000 -.000  .000 -.000  .000 -.000  .000 -.000  .000
"Alexander Orr Gens       "
"Everglades NP           "
  1   1
   .700   29.000    .000    .000    .000
  43.000   16.250  110.500   43.000
  0    1.500   3
  0    2.500   8
  0    2.500   6
  0    2.000   1
  0    1.500   4
  0     .045   2.000   5
  0   11.250
34
 1 0     5.0 163.8  13.4  30.0  35.6  .75  .050  2.00   .18  2.00   .07  2.00   .09  2.00   .03
 2 1    10.0 158.8  20.6  23.1  30.6 1.17  .050  2.00   .31  2.00   .11  2.00   .11  2.00   .04
 3 1    15.0 153.8  25.2  19.0  27.0 1.55  .050  2.00   .42  2.00   .15  2.00   .13  2.00   .05
 4 1    20.0 148.8  28.3  16.2  24.4 1.90  .050  2.00   .51  2.00   .19  2.00   .14  2.00   .05
 5 1    25.0 143.8  30.7  14.2  22.3 2.23  .050  2.00   .57  2.00   .21  2.00   .16  2.00   .06
 6 1    30.0 138.8  32.6  12.7  20.7 2.54  .050  2.00   .61  2.00   .23  2.00   .17  2.00   .06
 7 1    35.0 133.8  34.1  11.6  19.5 2.83  .050  2.00   .64  2.00   .24  2.00   .17  2.00   .07
 8 1    40.0 128.8  35.4  10.8  18.6 3.10  .050  2.00   .66  2.00   .24  2.00   .18  2.00   .07
 9 1    45.0 123.8  36.6  10.1  17.8 3.34  .050  2.00   .67  2.00   .25  2.00   .18  2.00   .07
10 1    50.0 118.8  37.6   9.6  17.3 3.55  .050  2.00   .68  2.00   .25  2.00   .18  2.00   .07
11 1    55.0 113.8  38.5   9.2  16.9 3.74  .050  2.00   .68  2.00   .25  2.00   .18  2.00   .07
12 1    60.0 108.8  39.3   8.9  16.6 3.90  .050  2.00   .68  2.00   .25  2.00   .17  2.00   .07
13 1    65.0 103.8  40.1   8.6  16.5 4.03  .050  2.00   .68  2.00   .25  2.00   .17  2.00   .06
14 1    70.0  98.8  40.9   8.5  16.5 4.12  .050  2.00   .68  2.00   .25  2.00   .16  2.00   .06
15 1    75.0  93.8  41.6   8.4  16.6 4.19  .050  2.00   .67  2.00   .25  2.00   .16  2.00   .06
16 1    80.0  88.8  42.4   8.4  16.9 4.22  .050  2.00   .67  2.00   .25  2.00   .15  2.00   .06
17 1    85.0  83.8  43.1   8.4  17.3 4.22  .050  2.00   .67  2.00   .25  2.00   .14  2.00   .05
18 1    90.0  78.8  43.8   8.6  17.8 4.19  .050  2.00   .66  2.00   .24  2.00   .13  2.00   .05
19 1    95.0  73.8  44.6   8.7  18.6 4.13  .050  2.00   .65  2.00   .24  2.00   .12  2.00   .05
20 1   100.0  68.8  45.4   9.0  19.5 4.03  .050  2.00   .65  2.00   .24  2.00   .11  2.00   .04
21 1   105.0  63.8  46.3   9.4  20.7 3.90  .050  2.00   .64  2.00   .24  2.00   .10  2.00   .04
22 1   110.0  58.8  47.3   9.8  22.3 3.75  .050  2.00   .62  2.00   .23  2.00   .08  2.00   .03
23 1   115.0  53.8  48.3  10.4  24.4 3.56  .050  2.00   .60  2.00   .22  2.00   .07  2.00   .03
24 1   120.0  48.8  49.5  11.2  27.0 3.35  .050  2.00   .58  2.00   .21  2.00   .05  2.00   .02
25 1   125.0  43.8  50.9  12.1  30.6 3.11  .050  2.00   .55  2.00   .20  2.00   .03  2.00   .01
26 1   130.0  38.8  52.6  13.4  35.6 2.84  .050  2.00   .50  2.00   .18  2.00   .02  2.00   .01
27 1   135.0  33.8  54.7  15.1  43.0 2.55  .050  2.00   .44  2.00   .16  2.00   .01  2.00   .00
28 1   140.0  28.8  57.5  17.4  54.7 2.25  .050  2.00   .36  2.00   .13  2.00   .01  2.00   .00
29 1   145.0  23.8  61.2  20.8  76.0 1.92  .050  2.00   .27  2.00   .10  2.00   .00  2.00   .00
30 1   150.0  18.8  66.9  26.1 126.1 1.57  .050  2.00   .16  2.00   .06  2.00   .00  2.00   .00
31 1   155.0  13.8  76.5  35.3 377.2 1.21  .050  2.00   .06  2.00   .02  2.00   .00  2.00   .00
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32	0	.3	168.5	1.0	42.0	42.5	.12	.050	2.00	.07	2.00	.03	2.00	.11	2.00	.03
33	1	6.7	162.1	16.3	27.2	33.7	.90	.050	2.00	.22	2.00	.08	2.00	.09	2.00	.03
34	1	161.8	7.0	110.5	68.8	68.8	.68	.050	2.00	.00	2.00	.00	2.00	.01	2.00	.00
34																
1	0	5.000	.050	-.002	.001	-.002	.001	-.003	.002	-.003	.002	.000	.001	-.001	.001	
2	1	10.000	.050	-.002	.001	-.003	.001	-.005	.002	-.005	.002	.000	.001	-.001	.001	
3	1	15.000	.050	-.002	.001	-.003	.001	-.006	.002	-.007	.002	.000	.001	-.001	.001	
4	1	20.000	.050	-.002	.001	-.003	.001	-.008	.003	-.008	.003	.000	.001	-.001	.000	
5	1	25.000	.050	-.003	.001	-.003	.001	-.008	.003	-.009	.003	.000	.001	-.001	.000	
6	1	30.000	.050	-.003	.001	-.003	.001	-.009	.003	-.009	.003	.000	.001	-.001	.000	
7	1	35.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
8	1	40.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
9	1	45.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
10	1	50.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
11	1	55.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
12	1	60.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
13	1	65.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.003	.000	.001	-.001	.000	
14	1	70.000	.050	-.002	.001	-.003	.001	-.009	.003	-.010	.002	.000	.001	-.001	.000	
15	1	75.000	.050	-.002	.001	-.003	.001	-.009	.002	-.010	.002	.000	.001	-.001	.000	
16	1	80.000	.050	-.002	.001	-.003	.001	-.009	.002	-.010	.002	.000	.001	-.001	.000	
17	1	85.000	.050	-.002	.001	-.003	.001	-.009	.002	-.010	.002	.000	.000	-.001	.000	
18	1	90.000	.050	-.002	.001	-.003	.001	-.009	.002	-.010	.002	.000	.000	-.001	.000	
19	1	95.000	.050	-.002	.001	-.003	.001	-.009	.002	-.010	.002	.000	.000	-.001	.000	
20	1	100.000	.050	-.002	.001	-.003	.001	-.009	.002	-.009	.002	.000	.000	-.001	.000	
21	1	105.000	.050	-.002	.001	-.003	.001	-.009	.002	-.009	.002	.000	.000	-.001	.000	
22	1	110.000	.050	-.002	.001	-.003	.001	-.009	.001	-.009	.001	.000	.000	-.001	.000	
23	1	115.000	.050	-.002	.001	-.003	.001	-.008	.001	-.009	.001	.000	.000	-.001	.000	
24	1	120.000	.050	-.002	.001	-.003	.000	-.008	.001	-.009	.001	.000	.000	-.001	.000	
25	1	125.000	.050	-.002	.000	-.003	.000	-.008	.001	-.008	.001	.000	.000	-.001	.000	
26	1	130.000	.050	-.002	.000	-.003	.000	-.007	.000	-.008	.000	.000	.000	-.001	.000	
27	1	135.000	.050	-.002	.000	-.003	.000	-.006	.000	-.007	.000	.000	.000	-.001	.000	
28	1	140.000	.050	-.002	.000	-.002	.000	-.005	.000	-.006	.000	.000	.000	-.000	.000	
29	1	145.000	.050	-.002	.000	-.002	.000	-.004	.000	-.004	.000	.000	.000	-.000	.000	
30	1	150.000	.050	-.001	.000	-.002	.000	-.003	.000	-.003	.000	.000	.000	-.000	.000	
31	1	155.000	.050	-.001	.000	-.001	.000	-.001	.000	-.001	.000	.000	.000	-.000	.000	
32	0	.266	.050	-.000	.002	-.001	.002	-.001	.001	-.001	.001	.001	.002	-.001	.002	
33	1	6.681	.050	-.002	.001	-.002	.001	-.004	.002	-.004	.002	.000	.001	-.001	.001	
34	1	161.750	.050	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

BEST AVAILABLE COPY

Check Sheet

Company Name: Miami Dade W+SD- Alexander Orr, Jr
Permit Number: 0250314-002-AC
PSD Number: 249
Permit Engineer: Kahn

Application:

- [x] Initial Application
  - [ ] Incompleteness Letters
  - [x] Responses
  - [ ] Waiver of Department Action
  - [ ] Department Response
  - [ ] Other

Cross References:

- [ ]
- [ ]
- [ ]

Intent:

- [x] Intent to Issue
- [x] Notice of Intent to Issue
- [x] Technical Evaluation
- [x] BACT Determination
- [x] Unsigned Permit
- Correspondence with:
  - [ ] EPA
  - [ ] Park Services
  - [x] Other
- [x] Proof of Publication
  - [ ] Petitions - (Related to extensions, hearings, etc.)
  - [ ] Waiver of Department Action
  - [ ] Other

Final Determination:

- [x] Final Determination
- [x] Signed Permit
- [x] BACT Determination
- [ ] Other

Post Permit Correspondence:

- [ ] Extensions/Amendments/Modifications
- [ ] Other

Z 333 618 199

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Jorge Rodriguez	
Street & Number Miami-Dade W&S Dept	
Post Office, State, & ZIP Code Coral Gables Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	7-15-99

PS Form **3800**, April 1995

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Jorge Rodriguez, PE
Miami-Dade W&S Dept.
4200 Salzedo St.
Coral Gables, Fl
33146-0316

4a. Article Number
Z 333 618 199

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery 7/19/99

5. Received By: *(Print Name)*
Tina Acosta

6. Signature: *(Addressee or Agent)*
X Tina M. Acosta

8. Addressee's Address *(Only if requested and fee is paid)*

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

MIAMI DAILY BUSINESS REVIEW

Published Daily except Saturday, Sunday and Legal Holidays
Miami, Dade County, Florida.

STATE OF FLORIDA
COUNTY OF DADE:

Before the undersigned authority personally appeared Octelma V. Ferbeyre, who on oath says that she is the Supervisor, Legal Notices of the Miami Daily Business Review f/k/a Miami Review, a daily (except Saturday, Sunday and Legal Holidays) newspaper, published at Miami in Dade County, Florida; that the attached copy of advertisement, being a Legal Advertisement of Notice in the matter of

MIAMI-DADE WATER AND SEWER DEPARTMENT PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT DEP FILE NO. 0250314-002-AC, PSD-FL-249

in the ....XXXXX.......... Court,

was published in said newspaper in the issues of
Jun 8, 1999

Affiant further says that the said Miami Daily Business Review is a newspaper published at Miami in said Dade County, Florida, and that the said newspaper has heretofore been continuously published in said Dade County, Florida, each day (except Saturday, Sunday and Legal Holidays) and has been entered as second class mail matter at the post office in Miami in said Dade County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

....

Sworn to and subscribed before me this
8 ....day of June ...., A.D. 19 99......

....

(SEAL)

Octelma V. Ferbeyre personally known to me.

OFFICIAL NOTARY SEAL
CHERYL H MARMER
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NUMBER
CC545384
MY COMMISSION EXPIRES
APR. 12,2000

PUBLIC NOTICE OF INTENT TO ISSUE AIR CONSTRUCTION PERMIT
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP FILE NO. 0250314-002-AC, PSD-FL-249
MIAMI-DADE WATER AND SEWER DEPARTMENT
ALEXANDER ORR, JR. WATER TREATMENT PLANT
STANDBY DIESEL ENGINE GENERATORS
MIAMI-DADE COUNTY

The Department of Environmental Protection (Department) gives notice of its intent to issue an air construction permit to Miami-Dade Water and Sewer Department, for the Alexander Orr, Jr. WTP located at 6800 SW 87 Avenue, Miami, Miami-Dade County. The permit is to allow the applicant to increase operation of four existing diesel engine generators to provide power generation capacity during periods of load-sharing with the local utility, during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions. The applicant's mailing address is: 4200 Salzedo Street, Coral Gables, Florida 33146-0316. A Best Available Control Technology (BACT) determination was required for nitrogen oxides (NOx) pursuant to Rule 62-212.400, F.A.C. and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). Nitrogen Oxides (NOx) emissions will be controlled by the use of fuel injection timing retardation and turbocharger aftercooling.

Total emissions of pollutants shall not exceed the following annual emission rates in tons per year: NOx, 403; PM/PM_{10}, 5.6; Sulfur dioxide, 5.0; VOC, 7.8; CO, 20.8.

An air quality impact analysis was conducted. Emissions from the facility will not cause or contribute to a violation of any state or federal ambient air quality standards. The maximum predicted PSD NO_2 increment consumed by all sources, including this project, in the nearest Class I (Everglades National Park) and Class II areas will be as follows:

Averaging Time and Class	Allowable Increment ($\mu g/m^3$)	Increment Consumed ($\mu g/m^3$)	Percent Consumed
Annual - Class I	2.5	0.86	34
Annual - Class II	25	24.1	96

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

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

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

Mediation is not available in this proceeding.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

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

Dept. of Environmental Protection	Dept. of Environmental Protection	Dade County Department of
Bureau of Air Regulation	Southeast District Office	Environmental Resources Mgmt.
Suite 4, 111 S. Magnolia Drive	400 North Congress Avenue	Suite 900, 33 Southwest 2nd. Ave.
Tallahassee, Florida, 32301	West Palm Beach, Florida 33401	Miami, Florida 33130-1540
Telephone: 850/488-0114	Telephone: 561/681-6600	Telephone: 305/372-6925
Fax: 850/922-6979		

The complete project file includes the application, technical evaluations, Draft permit, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Source Review Section, or the Department's reviewing engineer of this project, Joseph Kahn, P.E., at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114, for additional information.

Z 333 618 152

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Jorge Rodriguez	
Street & Number MD: W450	
Post Office, State, & ZIP Code Coral Gables Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0250314-002-AC PSD-FL-249	5-21-99

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Jorge Rodriguez, PE
Miami-Dade Water + Sewer
4200 Salzedo St.
Coral Gables, Fl 33146-0316

4a. Article Number
Z333 618 152

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
MAY 26 1999

SOUTH MIAMI BRA FL 33143 USPS

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X [signature]

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 374

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to Robert C Reading	
Street & Number Miami Dade	
Post Office, State, & ZIP Code Alexander Orr	
Postage Coral Gables Fl	
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 6-17-98 0250314-002-AC P50-F1-249	

PS Form **3800**, April 1995

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Robert C Reading
Miami Dade Water + Sewer
4200 Salzedo St.
Coral Gables, Fl
33146-0316

4a. Article Number
P 265 659 374

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
6/19/98

5. Received By: *(Print Name)*
L. BANFIELD

6. Signature: *(Addressee or Agent)*
X L. Banfield

8. Addressee's Address *(Only if requested and fee is paid)*

Is your **RETURN ADDRESS** completed on the reverse side?

Thank you for using Return Receipt Service.

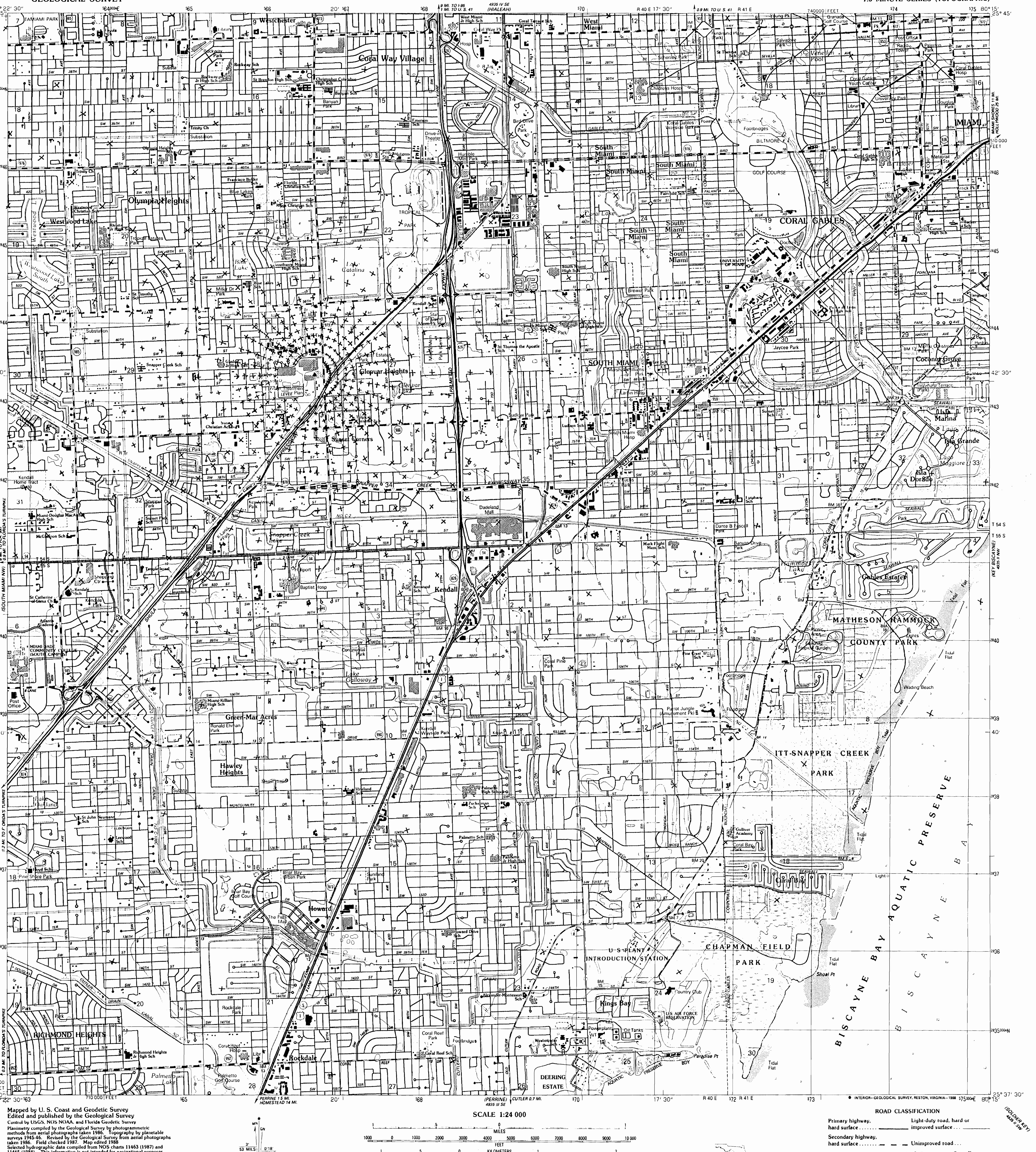
PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

0250314-002 1)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF FLORIDA

SOUTH MIAMI QUADRANGLE
FLORIDA-DADE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

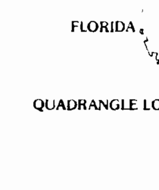


Mapped by U. S. Coast and Geodetic Survey
Edited and published by the Geological Survey
Control by USGS, NOS NOAA, and Florida Geodetic Survey
Planimetry compiled by the Geological Survey by photogrammetric methods from aerial photographs taken 1986. Topography by planetable surveys 1945-46. Revised by the Geological Survey from aerial photographs taken 1986. Field checked 1987. Map edited 1988
Selected hydrographic data compiled from NOS charts 11463 (1987) and 11465 (1984). This information is not intended for navigational purposes
Projection and 10,000-foot grid ticks: Florida coordinate system, east zone (transverse Mercator)
1000-meter Universal Transverse Mercator grid, zone 17
1927 North American Datum
To place on the predicted North American Datum 1983, move the projection lines 41 meters south and 21 meters west as shown by dashed corner ticks
There may be private inholdings within the boundaries of the National or State reservations shown on this map
No distinction made between houses, barns, and other buildings
Gray tint indicates areas in which only landmark buildings are shown
Dotted land lines established by State of Florida

UTM GRID AND 1988 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET. DATUM IS MEAN LOWER LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface	Light-duty road, hard or improved surface
Secondary highway, hard surface	Unimproved road

Interstate Route U. S. Route State Route
County Route

SOUTH MIAMI, FLA.

25080-F3-TF-024

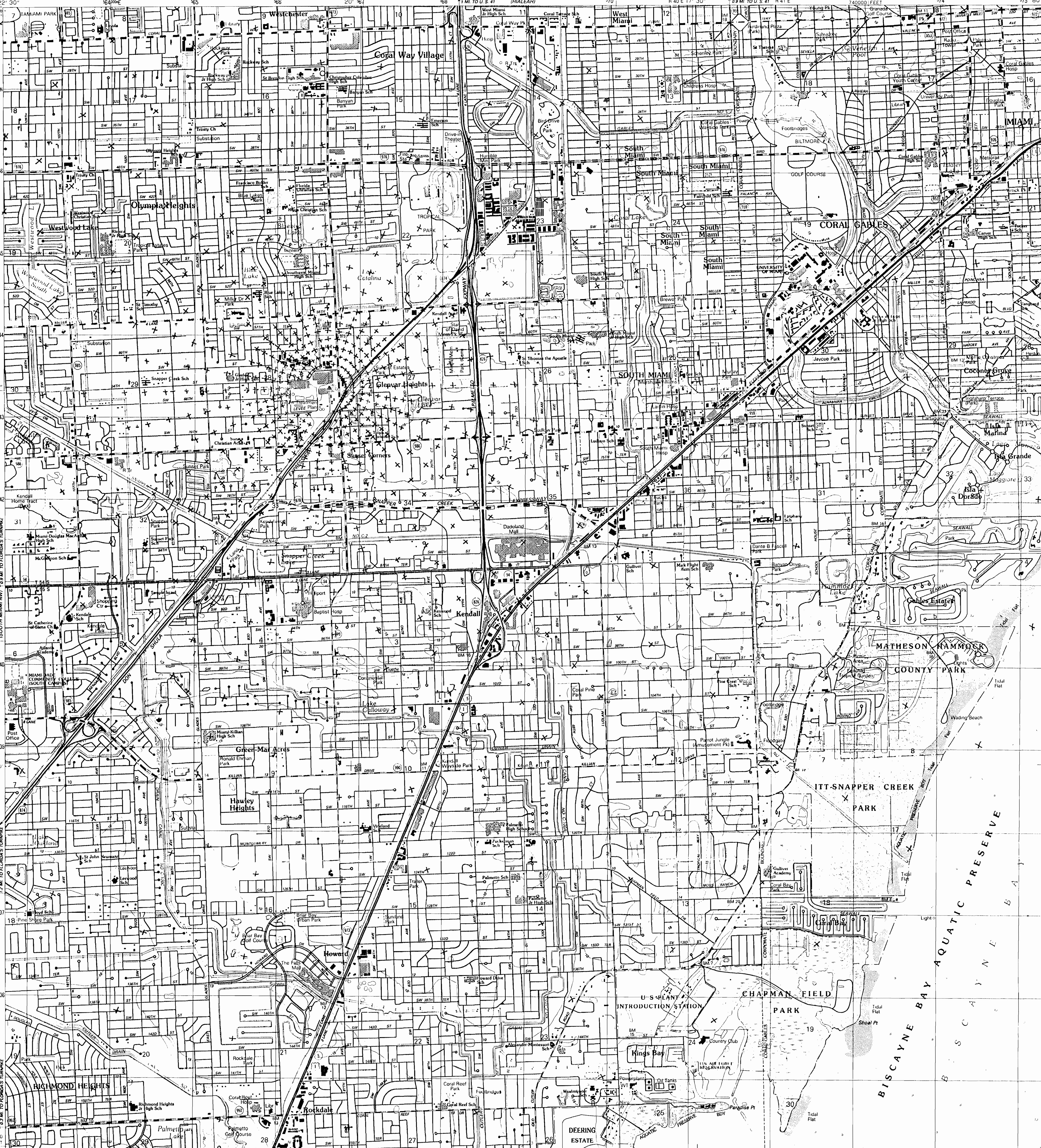
1988

DMA 4935 III NE–SERIES V847

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF FLORIDA

SOUTH MIAMI QUADRANGLE
FLORIDA-DADE CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



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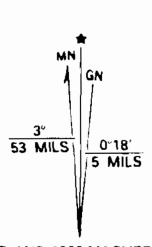

UTM GRID AND 1988 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

MILES
FEET
KILOMETERS
METERS

CONTOUR INTERVAL 5 FEET
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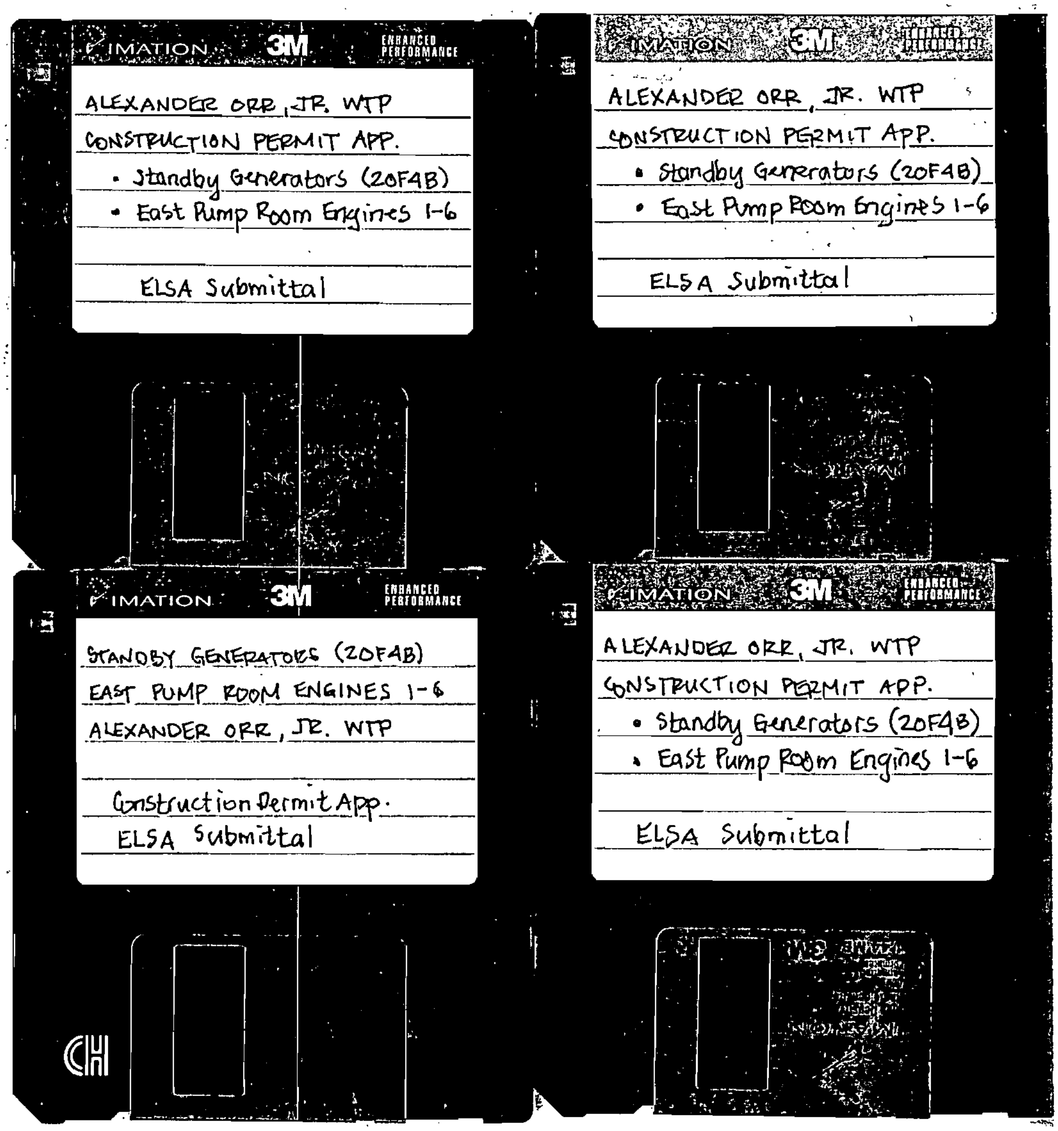
Primary highway, hard surface .... Light-duty road, hard or improved surface ...
Secondary highway, hard surface .... Unimproved road ...
Interstate Route U. S. Route State Route
County Route

SOUTH MIAMI, FLA.

25080-F3-TF-024

1988

DMA 4935 III NE–SERIES V847


IMATION
3M
ENHANCED PERFORMANCE
ALEXANDER ORR, JR. WTP
CONSTRUCTION PERMIT APP.
• Standby Generators (2OF4B)
• East Pump Room Engines 1-6
ELSA Submittal
IMATION
3M
ALEXANDER ORR, JR. WTP
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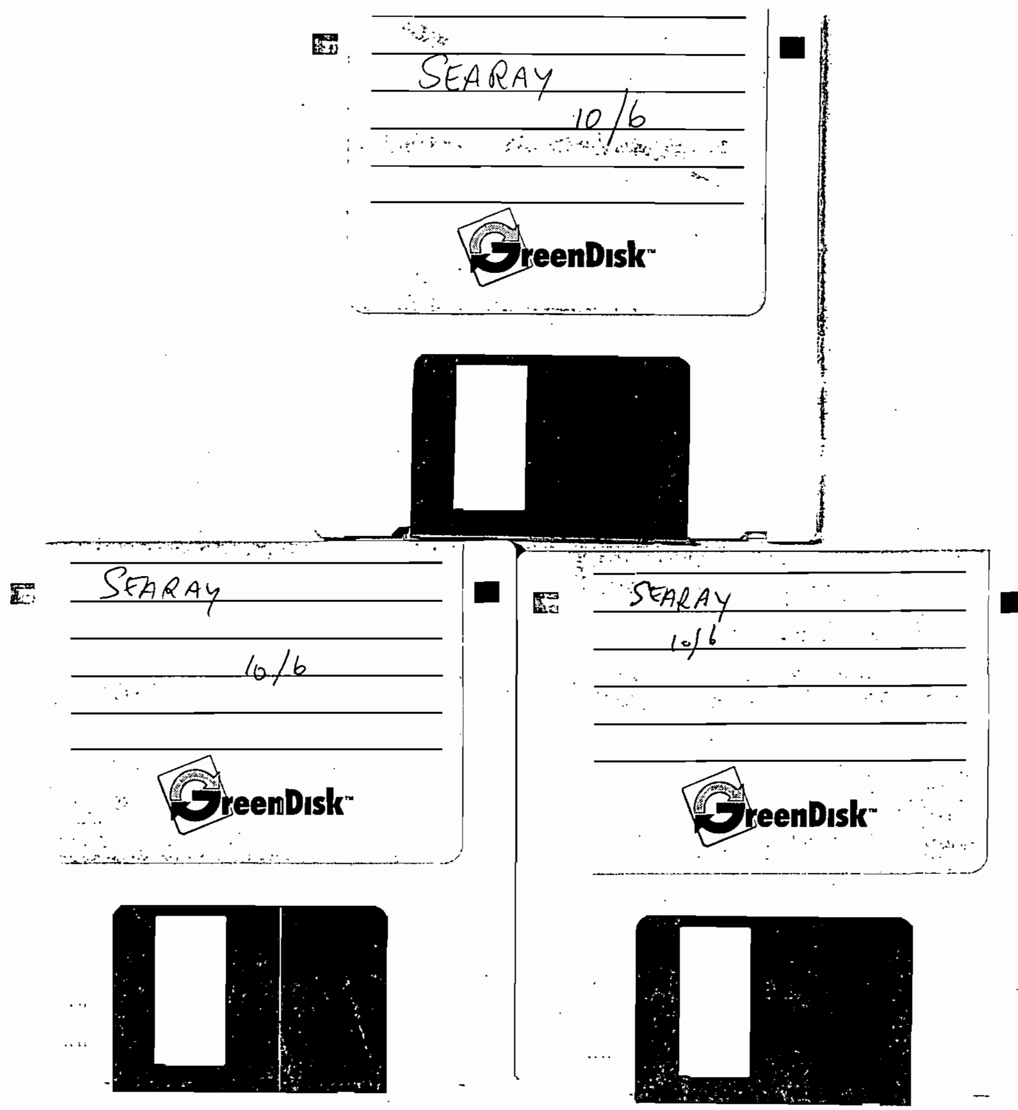
SEARAY
10/6
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