



Miami-Dade Water and Sewer Department
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June 22, 2005

Certified Mail: 7001 0360 0001 6783 0882

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Return Receipt

JUN 3 2005

Jeffery F. Koerner, P.E.
 BAR - Air Permitting South
 Florida Department of Environmental Protection
 Twin Towers Office Building
 2600 Blair Stone Road
 Tallahassee, FL 32399-2400

BUREAU OF AIR REGULATION

RE: Response to Request for Additional Information, DEP File No. 0250314-009-AC, Miami-Dade Water & Sewer Department (MDWASD); Application for Title V Air Construction Permit for Alexander Orr Jr. Water Treatment Plant (AOWTP)

Dear Mr. Koerner:

MDWASD acknowledges receipt of your letter requesting additional information for the referenced application. As discussed between my staff and yourself, attached please find a revised application for the installation of two additional EMD standby generators at the subject facility. These generators will form part of the standby generator bank which was the subject of PSD-FL-249. No changes to the potential emissions or permitted fuel limitation under that permit are proposed.

MDWASD has removed from this revised permit application the request to repermit unrelated work currently being done under Title V Air Construction Permit No. 0250314-007-AC. That work is progressing again and will continue under the abovementioned permit until further notice.

As the designated Responsible Official of this facility, I certify this request to be true, accurate, and complete based upon information and belief formed after reasonable inquiry. Please contact me at (786) 552-8112 or Mr. Richard M. O'Rourke, P.E. at (786) 552-8123 if there are any questions regarding this request.

Sincerely,

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

JSR/BMG/RMO/jrp

c: L. Tallam, FDEP/SED
 M. Muthiah, MD-DERM

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*Application for Air Construction Permit for the
**Installation of Standby Generators 5 and 6
Alexander Orr, Jr. Water Treatment Plant
Miami, Florida**
December, 2004 (Revised June, 2005)*

Miami-Dade Water and Sewer Department

**MIAMI-DADE
COUNTY**

RECEIVED

JUN 30 2005

BUREAU OF AIR REGULATION

APPLICATION INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

Air construction permit.

Air Operation Permit

- Initial Title V air operation permit.
 Title V air operation permit revision.
 Title V air operation permit renewal.
 Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.
 Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

- Air construction permit and Title V permit revision, incorporating the proposed project.
 Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

- I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

The Alexander Orr, Jr. WTP is considered a major source of air pollution and is required to obtain a Title V Air Operating Permit (Chapter 62-213, FAC). The FDEP issued Initial Title V Air Operation Permit No. 0250314-001-AV on August 8, 2000.

This permit application seeks to obtain a construction permit for the addition of two new standby generators to the existing bank of four similar units at the Alexander Orr, Jr. WTP. The additional generators are needed to ensure adequate redundant electrical capacity to supply the plant during power failures and other circumstances including severe weather warnings and events of potential electric utility power losses or reductions as well as during periods of load-sharing with the local utility.

These new standby generators will operate under the existing standby generator fuel limitation of 1,415,000 gallons per year as established by PSD-FL-249 and currently permitted under Operation Permit No. 0250314-008-AV. These new units serve to provide redundancy to the existing units and no additional operational hours or fuel usage is proposed for the bank of six units over the existing bank of four.

Air Construction Permit No. 0250314-007-AC is currently open for the unrelated replacement of three existing pump engines and the pump room generator and the FDEP recently issued Air Operation Permit Revision No. 0250314-008-AV to permit operation of three of the new units.

This project is a new project and not related to the work being done in the pump room under Air Construction Permit 0250314-007-AC.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
024 (proposed)	Diesel Engine Generator # 5, EMD model No. 20-645F4B	AC1F*	\$ 0.00
025 (proposed)	Diesel Engine Generator # 6, EMD model No. 20-645F4B	AC1F*	\$ 0.00
	*Note: Units are additional to an existing collectively-regulated bank of similar units. Potential emissions for individual units are not predictable but the new units do NOT add to the permitted potential emissions of the collectively-regulated bank.		

Application Processing Fee

Check one: Attached - Amount: \$ _____ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : Jorge S. Rodriguez, P.E.
2. Owner/Authorized Representative Mailing Address... Organization/Firm: Miami-Dade Water and Sewer Department Street Address: P.O. Box 330316 City: Miami State: FL Zip Code: 33233
3. Owner/Authorized Representative Telephone Numbers... Telephone: (786) 552 - 8112 Fax: (786) 552 - 8626
4. Owner/Authorized Representative Email Address: <u>rsj@miamidade.gov</u>
5. Owner/Authorized Representative Statement: <i>I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. 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 and all other requirements identified in this application to which the facility is subject. 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 the facility or any permitted emissions unit.</i>  Signature <u>6/23/05</u> Date

APPLICATION INFORMATION

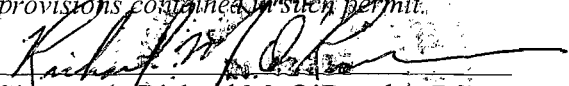
Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): <input type="checkbox"/> For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. <input type="checkbox"/> For a partnership or sole proprietorship, a general partner or the proprietor, respectively. <input type="checkbox"/> For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. <input type="checkbox"/> The designated representative at an Acid Rain source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: () - ext. Fax: () -
5. Application Responsible Official Email Address:
6. Application Responsible Official Certification: I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. 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 and all other applicable requirements identified in this application to which the Title V source is subject. 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 the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application. _____ Signature _____ Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: Richard M. O'Rourke, P.E. Registration Number: 42683
2. Professional Engineer Mailing Address... Organization/Firm: Miami-Dade Water and Sewer Department Street Address: P.O. Box 330316 City: Miami State: FL Zip Code: 33233-0316
3. Professional Engineer Telephone Numbers... Telephone: (786) 552 - 8123 ext. Fax: (786) 552 - 8640
4. Professional Engineer Email Address: <u>rorou01@miamidade.gov</u>
5. Professional Engineer Statement: <i>I, the undersigned, hereby certify, except as particularly noted herein*, that:</i> <i>(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution 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</i> <i>(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.</i> <i>(3) If the purpose of this application is to obtain a Title V air operation permit (check here <input type="checkbox"/> , 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 plan and schedule is submitted with this application.</i> <i>(4) If the purpose of this application is to obtain an air construction permit (check here <input checked="" type="checkbox"/> , if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here <input type="checkbox"/> , 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.</i> <i>(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here <input type="checkbox"/> , 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.</i>  Signature / Richard M. O'Rourke, P.E. (seal) P.E. No. 42683 Date 21 JUNE 2005

* Attach any exception to certification statement.

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a “major source” and a “synthetic minor source.”

1. <input type="checkbox"/> Small Business Stationary Source	<input type="checkbox"/> Unknown
2. <input type="checkbox"/> Synthetic Non - Title V Source	
3. <input checked="" type="checkbox"/> Title V Source	
4. <input checked="" type="checkbox"/> Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. <input type="checkbox"/> Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. <input type="checkbox"/> Major Source of Hazardous Air Pollutants (HAPs)	
7. <input type="checkbox"/> Synthetic Minor Source of HAPs	
8. <input type="checkbox"/> One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. <input type="checkbox"/> One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. <input type="checkbox"/> One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. <input type="checkbox"/> Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	
<p>This facility is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, specifically nitrogen oxides (NOx) and carbon monoxide (CO), exceeds 100 tons per year (TPY).</p> <p>Since the facility has the potential to emit more than 250 tons per year of NOx, modifications must be evaluated to determine if they shall be subject to the preconstruction review requirements of the rule. PSD-FL-249 was issued in 1999 to create an emissions bubble for the operation of the standby generators.</p> <p>This project is subject to the requirements of Rule 62-212.300, F.A.C., General Preconstruction Review Requirements as discussed in the attached report. This project will operate under the existing emissions bubble created by PSD-FL-249 and no additional impact analysis will be performed. The additional emission units included in this project are proposed to be subject to a specific existing emission limiting standard for purposes of Title V permitting as described in this application and within the attached report.</p>	

FACILITY INFORMATION

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility Wide Cap [Y or N]? (all units)	3. Emissions Unit ID Nos. Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap
NOX	N	009, 010, 011, 012 and two new (EU 024 and 025 proposed)		403	AMBIENT

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

Currently, the existing units Nos. 009, 010, 011 and 012 have a maximum allowable rate NOx emission of 4.12 lb/MMBtu each, and 403 tons per 12-consecutive month period by the conditions of the PSD-FL-249; there are no limits on the hours of operation, but the maximum fuel consumption allowed to be burned is 1,415,000 gals/year.

Basis: AMBIENT. Air modeling done in 1998 in conjunction with the PSD application submitted by MDWASD for increased generator usage (PSD-FL-249) established this cap to limit the impact on off-site receptors to below the PSD increment for NOx of 25 micrograms per cubic meter.

No changes to the limits established by PSD-FL-249 are proposed herein.

FACILITY INFORMATION

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot Plan: (Required for all permit applications, <u>except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought</u>) <input checked="" type="checkbox"/> Attached, Document ID: <u> A </u> <input type="checkbox"/> Previously Submitted, Date _____
2. Process Flow Diagram(s): (Required for all permit applications, <u>except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought</u>) <input checked="" type="checkbox"/> Attached, Document ID: <u> B </u> <input type="checkbox"/> Previously Submitted, Date _____
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, <u>except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought</u>) <input checked="" type="checkbox"/> Attached, Document ID: <u> C </u> <input type="checkbox"/> Previously Submitted, Date _____

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable (existing permitted facility)
2. Description of Proposed Construction or Modification: <input checked="" type="checkbox"/> Attached, Document ID: <u> Report </u>
3. Rule Applicability Analysis: <input checked="" type="checkbox"/> Attached, Document ID: <u> Report </u>
4. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): <input checked="" type="checkbox"/> Attached, Document ID: <u> D </u> <input type="checkbox"/> Not Applicable (no exempt units at facility)
5. Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
6. Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
7. Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
8. Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
9. Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

FACILITY INFORMATION

Additional Requirements for FESOP Applications

- | |
|--|
| 1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.):
<input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable (no exempt units at facility) |
|--|

Additional Requirements for Title V Air Operation Permit Applications

- | |
|--|
| 1. List of Insignificant Activities (Required for initial/renewal applications only):
<input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable (revision application) |
| 2. Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought):
<input type="checkbox"/> Attached, Document ID: _____
<input type="checkbox"/> Not Applicable (revision application with no change in applicable requirements) |
| 3. Compliance Report and Plan (Required for all initial/revision/renewal applications):
<input type="checkbox"/> Attached, Document ID: _____
Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing. |
| 4. List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only):
<input type="checkbox"/> Attached, Document ID: _____
<input type="checkbox"/> Equipment/Activities On site but Not Required to be Individually Listed
<input type="checkbox"/> Not Applicable |
| 5. Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) :
<input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable |
| 6. Requested Changes to Current Title V Air Operation Permit:
<input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable |

Additional Requirements Comment

Please note that all attachments referenced in this revised application were previously submitted with the original application and are not herein resubmitted.

EMISSIONS UNIT INFORMATION

Section [1] of [2]

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application - Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION

Section [1] of [2]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

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.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

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.

2. Description of Emissions Unit Addressed in this Section:

One (1) additional standby generator set added to an existing bank of four (4), model 20F4B as below.

3. Emissions Unit Identification Number: 024 (proposed)

4. Emissions Unit Status Code: C	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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9. Package Unit:

Manufacturer: Electro-Motive Division (EMD) of General Motors
Model Number: 20-645F4B

10. Generator Nameplate Rating: 2.865 MW

11. Emissions Unit Comment:

This emission unit consists of a 4,000 Bhp diesel fueled internal combustion prime mover coupled to a 2,865 KW generator.

The installation of proposed generator # 5 will begin soon after issuance of the requested air construction permit and MDWASD expects to complete installation and initial compliance testing in two years.

EMISSIONS UNIT INFORMATION

Section [1] of [2]

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

None

2. Control Device or Method Code(s):

EMISSIONS UNIT INFORMATION

Section [1] of [2]

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:				
2. Maximum Production Rate:				
3. Maximum Heat Input Rate: 195,270 MMBtu/yr (all EMD units combined)				
4. Maximum Incineration Rate: pounds/hr tons/day				
5. Requested Maximum Operating Schedule:				
<table border="0"> <tr> <td>hours/day</td> <td>days/week</td> </tr> <tr> <td>weeks/year</td> <td>hours/year</td> </tr> </table>	hours/day	days/week	weeks/year	hours/year
hours/day	days/week			
weeks/year	hours/year			
6. Operating Capacity/Schedule Comment:				
<p>The maximum heat input rate is for all standby generators combined (existing and proposed) and is based on: $(1,415,000 \text{ gal})(0.138 \text{ MMBtu/gal}) = 195,270 \text{ MMBtu/yr}$.</p> <p>The operation of all standby generators is limited by a fuel consumption limitation of 1,415,000 gallons for all standby generators combined, i.e. EU 009, 010, 011, 012 and two new (EU 024 and 025 proposed) by the conditions established by PSD-FL-249 and currently permitted under Operation Permit No. 0250314-008-AV.</p>				

EMISSIONS UNIT INFORMATION

Section [1] of [2]

C. EMISSION POINT (STACK/VENT) INFORMATION**(Optional for unregulated emissions units.)****Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram: EMDs		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Generator with a 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: 21 feet	7. Exit Diameter: 1.75 feet	
8. Exit Temperature: 635 °F	9. Actual Volumetric Flow Rate: 22350 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: 18 feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.9 North (km): 2,843.3		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:			

EMISSIONS UNIT INFORMATION

Section [1] of [2]

D. SEGMENT (PROCESS/FUEL) INFORMATION**Segment Description and Rate:** Segment 1 of 1

1. Segment Description (Process/Fuel Type): 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:	5. Maximum Annual Rate: 1,415 (combined)	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 138
10. Segment Comment: The maximum annual rate of 1,415,000 gallons/year is for all standby generators combined i.e. EU 009, 010, 011, 012 and two new (EU 024 and 025 proposed).		

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 402.3 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 4.12 lb/MMBtu Reference: As currently permitted (originally based on mfr. specs)	7. Emissions Method Code: 0
8. Calculation of Emissions: (1,415,000 gal/yr)(0.138 MMBtu/gal)(4.12 lb NOx/MMBtu)(1 ton/2000 lb) = 402.3 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all EMD standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 82.1 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 116 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.116 lb CO/gal)(1 ton/2000 lb) = 82.1 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO ₂ Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 5.01 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
5. Emission Factor: 7.08 lb/1000 gal Reference: Fuel Specification	7. Emissions Method Code: 2
8. Calculation of Emissions: (7.08 lb fuel/gal)(0.0005 lb S/lb fuel)(2 lb SO ₂ /lb S) = 0.00708 lb SO ₂ /gal (1,415,000 gal/yr)(0.00708 lb/gal)(1 ton/ 2000 lb) = 5.01 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particulate Matter 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 5.55 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 7.85 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.00785 lb/gal)(1 ton/ 2000 lb) = 5.55 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 8.14 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 11.5 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.0115 lb/gal)(1 ton/2000 lb) = 8.14 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -
ALLOWABLE EMISSIONS**

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: AMBIENT	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 4.12 lb NOx/MMBtu	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE 20	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Perform Initial VE Compliance monitoring using EPA Method 9	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

EMISSIONS UNIT INFORMATION

Section [1] of [2]

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information... Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Not Applicable	

EMISSIONS UNIT INFORMATION

Section [1] of [2]

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> B </u> <input type="checkbox"/> Previously Submitted, Date _____
2. Fuel Analysis or Specification (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> E </u> <input type="checkbox"/> Previously Submitted, Date _____
3. Detailed Description of Control Equipment (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: <u> N/A </u> <input type="checkbox"/> Previously Submitted, Date _____
4. Procedures for Startup and Shutdown (Required for all operation permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date _____ <input checked="" type="checkbox"/> Not Applicable
5. Operation and Maintenance Plan (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> F </u> <input type="checkbox"/> Previously Submitted, Date _____ <input type="checkbox"/> Not Applicable
6. Compliance Demonstration Reports/Records <input type="checkbox"/> Attached, Document ID: _____ Test Date(s)/Pollutant(s) Tested: _____ <input type="checkbox"/> Previously Submitted, Date: : _____ Test Date(s)/Pollutant(s) Tested: _____ <input type="checkbox"/> To be Submitted, Date (if known): _____ Test Date(s)/Pollutant(s) Tested: _____ <input checked="" type="checkbox"/> Not Applicable Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

EMISSIONS UNIT INFORMATION

Section [1] of [2]

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements <input type="checkbox"/> Attached, Document ID: _____
2. Compliance Assurance Monitoring <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
3. Alternative Methods of Operation <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
4. Alternative Modes of Operation (Emissions Trading) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
5. Acid Rain Part Application <input type="checkbox"/> Certificate of Representation (EPA Form No. 7610-1) <input type="checkbox"/> Copy Attached, Document ID: _____ <input type="checkbox"/> Acid Rain Part (Form No. 62-210.900(1)(a)) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Not Applicable

EMISSIONS UNIT INFORMATION

Section [1] of [2]

Additional Requirements Comment

EMISSIONS UNIT INFORMATION

Section [2] of [2]

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application - Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION

Section [2] of [2]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

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.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

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.

2. Description of Emissions Unit Addressed in this Section:
One (1) additional standby generator set added to an existing bank of four (4), model 20E4B as below.

3. Emissions Unit Identification Number: 025 (proposed)

4. Emissions Unit Status Code: C	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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9. Package Unit:
Manufacturer: Electro-Motive Division (EMD) of General Motors
Model Number: 20-645F4B

10. Generator Nameplate Rating: 2.865 MW

11. Emissions Unit Comment:

This emission unit consists of a 4,000 Bhp diesel fueled internal combustion prime mover coupled to a 2,865 KW generator.

Proposed generator # 6 and the required switchgear expansion is in the initial planning stage and construction is anticipated to begin within four years of the issuance date of this requested permit.

EMISSIONS UNIT INFORMATION

Section [2] of [2]

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

None

2. Control Device or Method Code(s):

EMISSIONS UNIT INFORMATION

Section [2] of [2]

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:				
2. Maximum Production Rate:				
3. Maximum Heat Input Rate: 195,270 MMBtu/yr (all EMD units combined)				
4. Maximum Incineration Rate: pounds/hr tons/day				
6. Requested Maximum Operating Schedule:				
<table border="0"> <tr> <td>hours/day</td> <td>days/week</td> </tr> <tr> <td>weeks/year</td> <td>hours/year</td> </tr> </table>	hours/day	days/week	weeks/year	hours/year
hours/day	days/week			
weeks/year	hours/year			
6. Operating Capacity/Schedule Comment:				
<p>The maximum heat input rate is for all standby generators combined (existing and proposed) and is based on: $(1,415,000 \text{ gal})(0.138 \text{ MMBtu/gal}) = 195,270 \text{ MMBtu/yr}$.</p> <p>The operation of all standby generators is limited by a fuel consumption limitation of 1,415,000 gallons for all standby generators combined, i.e. EU 009, 010, 011, 012 and two new (EU 024 and 025 proposed) by the conditions established by PSD-FL-249 and currently permitted under Operation Permit No. 0250314-008-AV.</p>				

EMISSIONS UNIT INFORMATION

Section [2] of [2]

**C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)****Emission Point Description and Type**

1. Identification of Point on Plot Plan or Flow Diagram: EMDs		2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Generator with a 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: 21 feet	7. Exit Diameter: 1.75 feet	
8. Exit Temperature: 635 °F	9. Actual Volumetric Flow Rate: 22350 acfm	10. Water Vapor: %	
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: 18 feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.9 North (km): 2,843.3		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:			

EMISSIONS UNIT INFORMATION

Section [2] of [2]

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): 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:	5. Maximum Annual Rate: 1,415 (combined)	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 138
10. Segment Comment: The maximum annual rate of 1,415,000 gallons/year is for all standby generators combined i.e. EU 009, 010, 011, 012 and two new (EU 024 and 025 proposed).		

EMISSIONS UNIT INFORMATION

Section [2] of [2]

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX			EL
CO			NS
SOX			NS
PM10			NS
VOC			NS

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 402.3 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 4.12 lb/MMBtu Reference: As currently permitted (originally based on mfr. specs)	7. Emissions Method Code: 0
8. Calculation of Emissions: (1,415,000 gal/yr)(0.138 MMBtu/gal)(4.12 lb NOx/MMBtu)(1 ton/2000 lb) = 402.3 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all EMD standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 82.1 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 116 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.116 lb CO/gal)(1 ton/2000 lb) = 82.1 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO ₂ Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 5.01 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
7. Emission Factor: 7.08 lb/1000 gal Reference: Fuel Specification	7. Emissions Method Code: 2
8. Calculation of Emissions: (7.08 lb fuel/gal)(0.0005 lb S/lb fuel)(2 lb SO ₂ /lb S) = 0.00708 lb SO ₂ /gal (1,415,000 gal/yr)(0.00708 lb/gal)(1 ton/ 2000 lb) = 5.01 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particulate Matter 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 5.55 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
8. Emission Factor: 7.85 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.00785 lb/gal)(1 ton/ 2000 lb) = 5.55 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION –
POTENTIAL/ESTIMATED FUGITIVE EMISSIONS**

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 8.14 ton/year (all EMD units combined)	4. Synthetically Limited? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Range of Estimated Fugitive Emissions (as applicable): Not Applicable to tons/year	
6. Emission Factor: 11.5 lb/1000 gal Reference: SCC 2-02-004-01 EPA FIRE VER 6.25	7. Emissions Method Code: 3
8. Calculation of Emissions: (1,415,000 gal/yr)(0.0115 lb/gal)(1 ton/2000 lb) = 8.14 ton/year	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Potential emission in tons per year is based on annual fuel consumption limitation of 1,415,000 gallons for all standby generators.	

**F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION -
ALLOWABLE EMISSIONS**

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: AMBIENT	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 4.12 lb NOx/MMBtu	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: VE 20	2. Basis for Allowable Opacity: <input checked="" type="checkbox"/> Rule <input type="checkbox"/> Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Perform Initial VE Compliance monitoring using EPA Method 9	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

EMISSIONS UNIT INFORMATION

Section [2] of [2]

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	<input type="checkbox"/> Rule <input type="checkbox"/> Other
4. Monitor Information... Manufacturer: Model Number: Serial Number:	
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Not Applicable	

EMISSIONS UNIT INFORMATION

Section [2] of [2]

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> B </u> <input type="checkbox"/> Previously Submitted, Date _____
2. Fuel Analysis or Specification (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> E </u> <input type="checkbox"/> Previously Submitted, Date _____
3. Detailed Description of Control Equipment (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: <u> N/A </u> <input type="checkbox"/> Previously Submitted, Date _____
4. Procedures for Startup and Shutdown (Required for all operation permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date _____ <input checked="" type="checkbox"/> Not Applicable
5. Operation and Maintenance Plan (Required for all permit applications, <u>except Title V air operation permit revision applications</u> if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) <input checked="" type="checkbox"/> Attached, Document ID: <u> F </u> <input type="checkbox"/> Previously Submitted, Date _____ <input type="checkbox"/> Not Applicable
6. Compliance Demonstration Reports/Records <input type="checkbox"/> Attached, Document ID: _____ Test Date(s)/Pollutant(s) Tested: _____ <input type="checkbox"/> Previously Submitted, Date: : _____ Test Date(s)/Pollutant(s) Tested: _____ <input type="checkbox"/> To be Submitted, Date (if known): _____ Test Date(s)/Pollutant(s) Tested: _____ <input checked="" type="checkbox"/> Not Applicable Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7. Other Information Required by Rule or Statute <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

EMISSIONS UNIT INFORMATION

Section [2] of [2]

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) <input type="checkbox"/> Attached, Document ID: _____ <input checked="" type="checkbox"/> Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements <input type="checkbox"/> Attached, Document ID: _____
2. Compliance Assurance Monitoring <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
3. Alternative Methods of Operation <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
4. Alternative Modes of Operation (Emissions Trading) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Not Applicable
5. Acid Rain Part Application <input type="checkbox"/> Certificate of Representation (EPA Form No. 7610-1) <input type="checkbox"/> Copy Attached, Document ID: _____ <input type="checkbox"/> Acid Rain Part (Form No. 62-210.900(1)(a)) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> New Unit Exemption (Form No. 62-210.900(1)(a)2.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) <input type="checkbox"/> Attached, Document ID: _____ <input type="checkbox"/> Previously Submitted, Date: _____ <input type="checkbox"/> Not Applicable

EMISSIONS UNIT INFORMATION

Section [2] of [2]

Additional Requirements Comment

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DEP Application for Air Permit Form 62-210.900(1)

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Acronyms

acfm	actual cubic feet per minute
ARC	ambient reference concentration
BACT	Best Achievable Control Technology
bhp	brake horsepower
bhp-hr	brake horsepower-hour
BSFC	brake-specific fuel consumption
CAA	Clean Air Act
CO ₂	carbon dioxide
CO	carbon monoxide
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FLM	Federal Land Manager
FPL	Florida Power & Light Company
fps	feet per second
ft	foot (or feet)
g/bhp-hr	gram(s) per brake horsepower-hour
g/s	gram(s) per second
GEP	good engineering practice
H ₂ SO 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
LNG	liquefied natural gas
LPG	liquefied petroleum gas
µg/m ³	microgram(s) per cubic meter, 1 µg = 10 ⁻⁹ kg
m	meter
m ³ /s	cubic meter(s) per second
MDWASD	Miami-Dade Water and Sewer Department
MIA	Miami International Airport
m/s	meter(s) per second

Acronyms (cont.)

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
PM10	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
scfm	standard cubic feet per minute
SCR	selective catalytic reduction
SO ₂	sulfur dioxide
SO ₃	sulfite
SO ₄	sulfate
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WTP	water treatment plant
WWTP	wastewater treatment plant

Introduction

In accordance with Chapter 62-210 F.A.C. *Stationary Sources - General Requirements*; § 62-210.300 *Permits Required*, Miami-Dade Water and Sewer Department (MDWASD) is applying for a Title V Air Construction Permit to permit the installation of two additional diesel-fueled standby generator sets (hereafter "generator" and "generator set" may be used interchangeably) to the existing bank of four such generators at its Alexander Orr, Jr. Water Treatment Plant (WTP) in Miami, Florida.

This increase in the number of generators will provide needed redundant capacity to the existing backup power generation equipment as required to ensure uninterrupted water supply and pressure to that portion of Miami-Dade County's population served by the facility.

Alexander Orr, Jr. WTP is currently served by four 2.85 MW standby generators. This bank of four General Motors Electro-Motive Division (EMD) Model 20-645F4B generators provides backup power for the bulk of the plant and, in conjunction with backup diesel- and natural gas-fired high-service pump engines, can run the entire water treatment plant in the event of an emergency, power loss from Florida Power & Light (FPL), or in the event that FPL requests the plant to come off the power grid, fully or partially, during periods of high power demand, a situation that is normally referred as "peak shaving". In the most extreme hypothetical circumstances (e.g., full FPL power loss to the plant along with major distribution water main breakage necessitating use of all pumps to minimize pressure drop), all four of the currently existing EMD generators would need to be online simultaneously to provide adequate electrical capacity for the plant. The additional generators are needed to provide a reserve capacity for significant inrush loads during equipment startup and redundancy to the existing units under all possible scenarios.

Note that a separate emergency generator is currently being constructed at Alexander Orr, Jr. WTP under Air Construction Permit Number 0250314-007-AC. This 900 kW-rated generator is powered by a Caterpillar Model 3508 TA-130 diesel-fueled engine and is not part of the above-mentioned bank of standby generators. It provides additional redundant emergency back-up power to the high-service pump room only, mainly for pump and pump engine control purposes, in the event of a failure of the main standby generator system. Replacement of aging equipment in the pump room was begun in 1998.

The additional of two standby generators proposed herein is a new project and not related to the pump room modifications.

An air quality impact analysis is not required in support of this application. The proposed standby generator units are being added to an existing collectively regulated group of emission units and will operate under the existing standby generator fuel limitation of 1,415,000 gallons per year as established by PSD-FL-249 and currently permitted under Title V Air Operation Permit Revision No. 0250314-008-AV. These new units serve to provide redundancy to the existing units and no additional operational hours or fuel usage is proposed for the bank of six units over the existing bank of four.

Questions regarding the application can be addressed to the individual listed on the following page at Miami-Dade Water and Sewer Department in Miami, Florida:

Section 1 – Introduction (cont.)

Mr. Richard M. O'Rourke, P.E.
Miami-Dade Water and Sewer Department
P.O. Box 330316 Miami, Florida 33233-0316

Telephone: (786) 552-8123
FAX: (786) 552-8640

Facility Information

2.1. Facility Description

The facility, the Alexander Orr, Jr. Water Treatment Plant, is a municipally-owned water treatment plant providing potable water to the public. The Miami-Dade Water and Sewer Department (MDWASD) is the largest public utility in the southeastern United States and the sixth largest in the country, providing direct services to approximately 410,000 retail customers. Additionally, wholesale water and/or wastewater service is provided to 18 municipalities in the county. Miami-Dade County's current population of 2 million is expected to reach the 3 million mark by the year 2015. The Alexander Orr, Jr. WTP produces approximately half the water supply for the MDWASD system.

The layout of the Alexander Orr, Jr. WTP is shown in Figure 2-1. The plant is a lime softening water treatment plant consisting of lime softening tanks, a filter gallery, and chlorine contact basins, along with the associated lime recovery plant (sludge thickening tanks, lime recovery kiln, and lime storage silos), pump rooms (east and west), finished water reservoir storage, maintenance and control facilities, and standby power system (generators, pump engines, switchgear, and fuel tanks).

2.2. Standard Industrial Classification Codes (SIC)

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

2.3. Facility Location

The Alexander Orr, Jr. WTP is located at 6800 SW 87 Avenue, Miami, Miami-Dade County, Florida, as shown in Figure 2-2. UTM coordinates are: Zone 17; 565.9 km E and 2843.3 km N. The area immediately surrounding the plant 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 SW 87th Avenue. The plant is located approximately 7 miles south of the Miami International Airport, and is approximately 10 miles southwest of downtown Miami.

Section 2 – Facility Information (cont.)

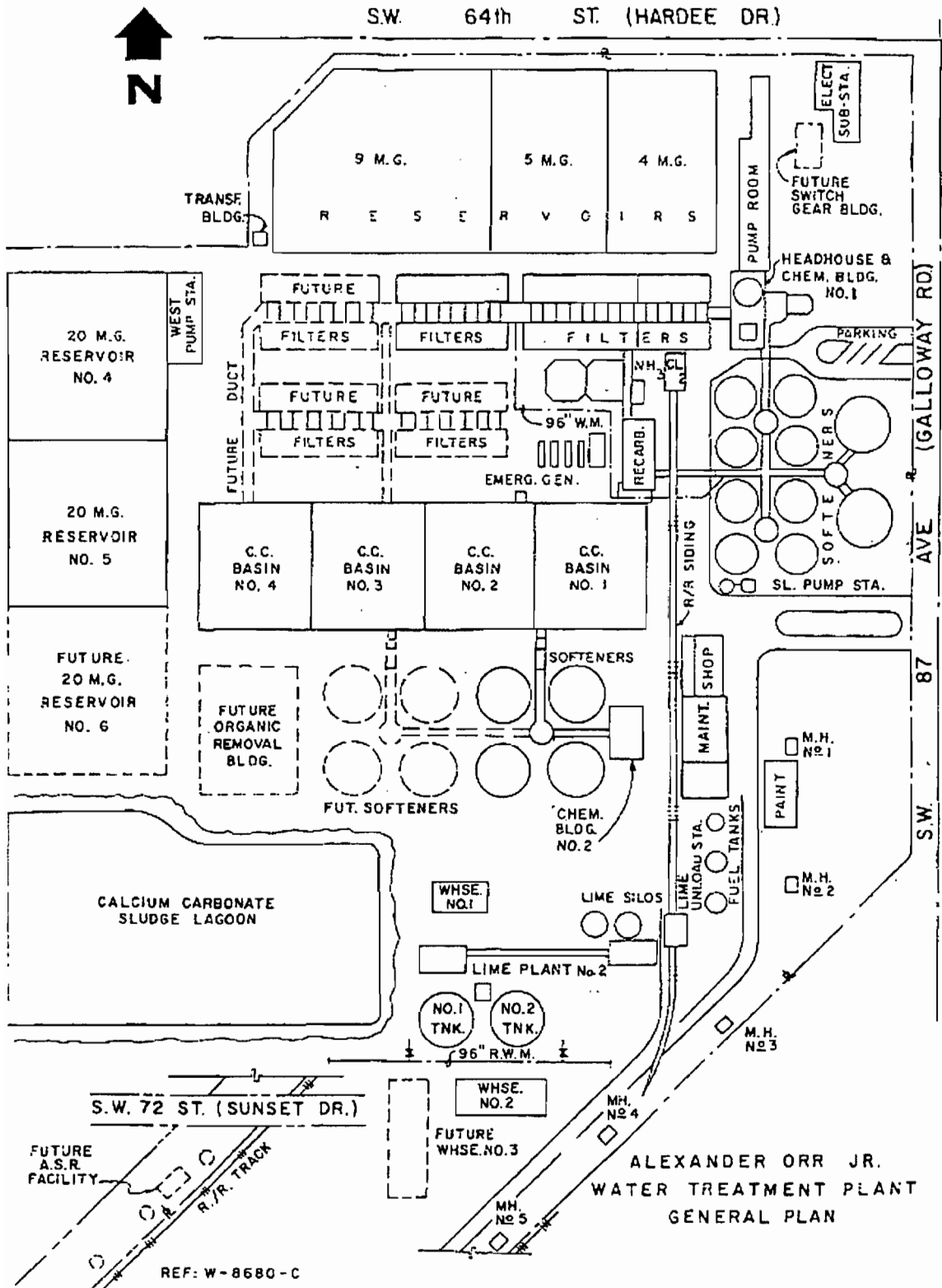


Figure 2-1 Alexander Orr, Jr. Water Treatment Plant Layout

Section 2 – Facility Information (cont.)

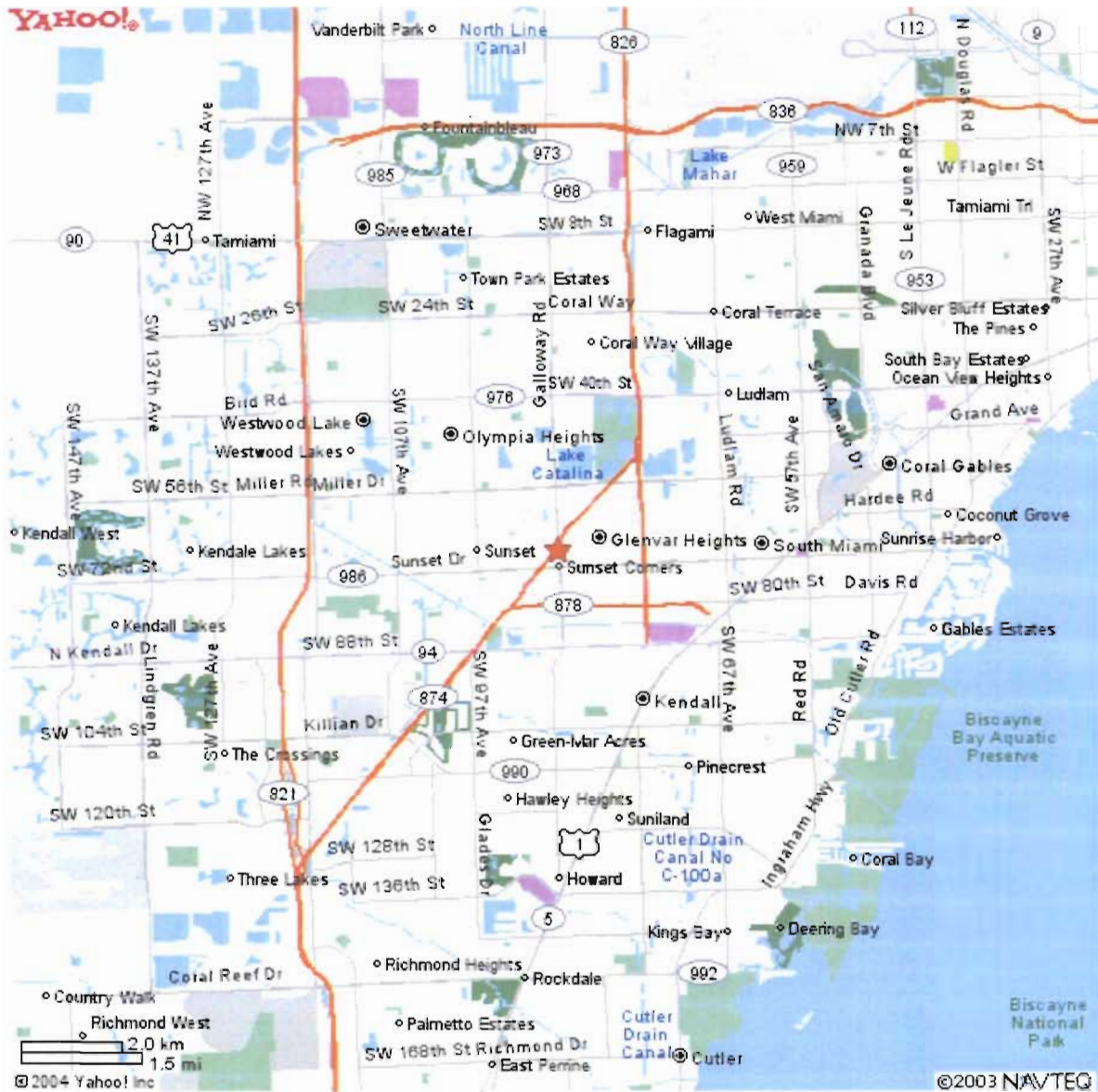


Figure 2-2 Alexander Orr, Jr. Water Treatment Plant Location

Facility Title V Overview

3.1. Emissions Units

There are three major sources of emissions at the plant: the lime recovery plant, the diesel- and/or natural gas-fueled engine-driven pumps (ongoing removal and replacement under Air Construction Permit Number 0250314-007-AC), and the standby diesel-fueled engine-driven generator sets. The lime recovery plant recovers lime (CaO) from the water treatment process by recalcination of calcium carbonate-rich treatment sludge (a precipitate from the water treatment process) in a rotary kiln. The diesel- and/or natural gas-fueled engine-driven pumps provide high-pressure service directly to the water distribution system. The standby diesel-fueled engine-driven generator sets provide standby electrical power for the entire facility. The plant also includes emergency generators at the pump room and at the lime recovery plant and an emergency rotation engine for the rotary kiln that provide additional redundancy to the standby generators for critical functions.

3.2. Regulated Emission Units

The **regulated** emissions units currently permitted under Title V Air Operation Permit Revision No. 0250314-008-AV are:

Emissions Unit No.	Emissions Unit Descriptions
007	Rotary Lime Recalcining Kiln
009	Standby Diesel Engine Generator # 1
010	Standby Diesel Engine Generator # 2
011	Standby Diesel Engine Generator # 3
012	Standby Diesel Engine Generator # 4
023	Pump Room Emergency Diesel Engine Generator

The following emissions unit is currently permitted as "regulated" but should be reclassified as "insignificant" in accordance with paragraph 62-213.430(6)(b) F.A.C. as emissions from these silos are below 5 ton/year of PM as shown in Table 3-1 and it meets all other conditions for consideration as insignificant. A request for this reclassification is pending as part of the Air Operation Permit Renewal application submitted to FDEP on February 4, 2005.

008	Two (2) 1,050 tons each lime silos
-----	------------------------------------

3.2.1. Lime Recovery Kiln (EU 007)

The Alexander Orr, Jr. WTP includes a lime recovery (recalcining) plant rated at 150 tons per day of dry output. The rotary kiln recovers water softening chemicals for process reuse onsite. Lime sludge material from the WTP clarifiers, a direct byproduct of the primary treatment process, is pumped to the on-site lime recovery plant where it is dewatered with centrifuges, air dried, and recalcinated in a natural gas-fired rotary kiln. This beneficial reuse of lime products through recovery and recalcining eliminates

Section 3 – Facility Title V Overview (cont.)

transportation air emissions associated with the supply and disposal of these materials. Productive operation of the lime recovery plant began February 1, 1982.

Calcium carbonate-rich sludge (90% CaCO₃) from the plant's water treatment process is fed into a 275 foot long, 10 foot diameter rotating recovery kiln where it is converted into lime (CaO, also called quicklime or burnt lime) and carbon dioxide (CO₂). Energy for the process is provided by a natural gas burner located at the discharge end of the recovery kiln. The chemical equation for the calcination or, in this case, recalcination process is:



Figure 3-1 Alexander Orr, Jr. WTP Lime Recovery Plant

An impingement-tray wet scrubber at the firing end of the recovery kiln reduces particulate matter emission from combustion gases and carbon dioxide exiting the recovery kiln. Lime solids are discharged into an integral tube cooler at the firing end of the recovery kiln. Both the process end-products, lime and carbon dioxide gas, are reused in the lime softening process. The calcium oxide or lime produced is transferred

to the chemical building where it is hydrated (slaked) and reused in the softening process. The carbon dioxide-rich exhaust gas from the recovery kiln is wet-scrubbed and introduced into the water treatment process through a submerged diffuser system where it is absorbed for reduction of pH and stabilization of the water to prevent after-precipitation or scale formation in the pipelines and on filter sand.

3.2.2. Lime Storage Silos (EU 008)

There are two 1050 ton capacity lime silos located at the Alexander Orr, Jr. WTP lime recovery plant. Recovered lime is transferred from the kiln discharge to the silos via a belt conveyor and bucket elevator system. A star feeder feeds lime from the bases of the silos into an "airveyor" system which pneumatically conveys the lime to storage bins at the chemical houses where it is metered into the treatment process. The silos are equipped with a common baghouse to control particulate emissions.

The lime silos are currently permitted jointly as "regulated" but should be reclassified as "insignificant" in accordance with paragraph 62-213.430(6)(b) F.A.C. as emissions from these silos are below 5 ton/year of PM as shown in Table 3-1 and they meet all other conditions for consideration as insignificant. A request for this reclassification is pending as part of the Air Operation Permit Renewal application submitted to FDEP on February 4, 2005.

Section 3 – Facility Title V Overview (cont.)

Table 3-1 Emissions from Lime Storage Silos Alexander Orr, Jr. Water Treatment Plant Miami-Dade Water and Sewer Department						
Compound	Emission Factor Reference ¹	Emission Factor (lb/ton)	Design Capacity (tons/day)	Number of Units	Total Potential Emissions (2 silos)	
					(lbs/yr)	(tpy)
Criteria Pollutants						
PM	AP-42, Table 11.26-1	0.0070	75	2	383	0.19

¹ EMISSION FACTORS FOR TALC PROCESSING: Final product storage bin loading, with fabric filter (SCC 3-05-089-85).
NOTE: SCC Code for lime silos (3-05-016-13) has no accompanying emissions data under AP-42. The closest reasonable analogues in the area of controlled product handling/storage are talc (SCC 3-05-089-85) at 0.0035 lb/Mlb or soda ash (SCC 3-01-023-99) at 0.0051 lb/ton.

3.2.3. Standby Generator Units (EU 009 – 012)



Figure 3-2 Alexander Orr, Jr. WTP Standby Generator Bank

The existing standby generator source is a bank of four 4,000-hp EMD Model 20-645F4B IC engines, each coupled to a 2,865-kW continuous-rated electrical generator. All engines are diesel-fueled, 20-cylinder, 2-cycle, and turbocharged.

The generator sets are operated to provide the necessary and adequate back up 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 as needed to ensure uninterrupted potable water supply to that portion of the Dade County population served by the facility.

Section 3 – Facility Title V Overview (cont.)

3.2.4. Pump Room Emergency Generator (EU 023)

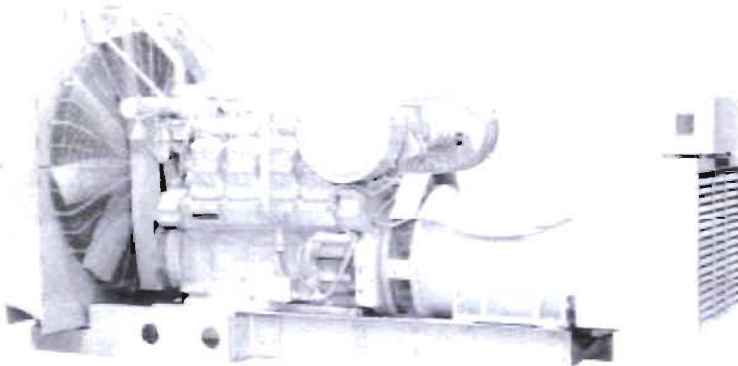


Figure 3-3 Caterpillar 3508 Series Engine and Generator

A Caterpillar Model 3508 TA-130 Series diesel engine driven generator rated at 900 kW is installed near the pump room to provide emergency power and redundancy to the standby generators for critical functions.

The Model 3508 TA-130 is in Caterpillar's 3500 engine series that are designed to operate reliably at 1800 rpm

continuously. The Model 3508 TA-130 engine is a V-8 cylinder engine with a 6.7" bore and 7.5" stroke and displacement of 2105 in³. This is a turbocharged engine, and power output at the design aftercooler operating temperature of 130° F ranges from 379 to 1332 bhp at 1800 rpm.

3.3. Unregulated Emission Units

The **unregulated** emissions units currently permitted under Title V Air Operation Permit Revision No. 0250314-008-AV are:

Emissions Unit No.	Emissions Unit Descriptions
005	Engine driving pump rated at 1,500 hp fired with diesel fuel, or natural gas, unit No. 5
006	Engine driving pump rated at 2,113 hp fired with diesel fuel or natural gas, unit No. 6
018	Natural Gas Engine Driven Pump, Caterpillar Model 3512 LE-130, Pump No. 3
019	Natural Gas Engine Driven Pump, Caterpillar Model 3512 LE-130, Pump No. 4
021	Backup generator for rotary kiln rated at 250 kW
022	Railcar lime unloading rack

3.3.1. High Service Pump Engines (EU 005, 006, 018, 019)

Finished water from the Alexander Orr, Jr. WTP is distributed to its service area, generally defined as that part of Miami-Dade County south of Flagler Street, by means of a combination of engine-driven and electric motor-driven high-service pumps located on the facility grounds in two pump rooms. All engine-driven pumps are located in the east pump room which is undergoing extensive phased remodeling with all existing engines,

Section 3 – Facility Title V Overview (cont.)

most dating from the early 1950's, slated for replacement. Removal and replacement of Pump Engine Nos. 1 – 5 (EU 001 – 005) was permitted under Air Construction Permit 0250314-005-AC and extended under Air Construction Permit 0250314-007-AC. Pump Engine No. 6 (EU 006) will be the subject of a future construction application.

3.3.1.1. Former Pump Engine Nos. 1 - 4 (former EU 001 - 004)

The formerly-existing pumps Nos. 1, 2, 3 and 4, were driven by similar 825 brake horsepower (bhp) Worthington diesel fueled engines. Pump engine No. 1 (EU 001) was also coupled to a 750 kilowatt (KW) generator, serving as the emergency generator for the pump room when the generator was excited and the pump drive not clutched in. Pump engine No. 1 was replaced with a 900 kW Caterpillar generator set (see EU 023 above) under Air Construction Permit 0250314-005-AC and extended under Air Construction Permit 0250314-007-AC. Pump engine No. 2 (EU 002) was permanently removed from service in the early 1990's and cannibalized for parts to maintain the three similar units remaining and, while it was included in the initial inventory of emissions units, it was never permitted under any Title V permit. Pump engine Nos. 3 and 4 were replaced by Caterpillar natural gas-fueled prime movers (see EU 018 and 019 below) under the same permits. These three new units, EU 018, 019, and 023, are newly permitted under Title V Air Operation Permit Revision No. 0250314-008-AV.

3.3.1.2. Pump Engine No. 5 (EU 005)

Pump engine No. 5 (EU ID No. 005) began service in August 1951, driving a 40 million gallons per day (mgd) pump. This Worthington Model SW14 prime mover was originally installed in 1951 as a dual fuel (diesel or diesel/natural gas) engine. However the engine has been operated as single fuel, diesel only, since about 1985, for maintenance and safety reasons.

Pump engine No. 5 and its associated pump are to be removed and replaced by Caterpillar Model G3608LE TA-130 engine and a Flowserve Model 600LNEC1150 high-service pump rated at 40 mgd as authorized by Air Construction Permit 0250314-005-AC and extended under Air Construction Permit 0250314-007-AC. Because of the contractor difficulties experienced with the replacement of this engine, MDWASD does not expect to begin this replacement before the August 2005 expiration of the air operation permit. MDWASD will submit a Title V Air Construction Permit application at a future date to repermit the replacement of this emission unit.

3.3.1.3. Pump Engine No. 6 (EU 006)

Pump engine No. 6 (EU ID No. 006) began service in September 1956, driving a 50 million gallons per day (mgd) pump. This 2113 bhp Enterprise Model DGSQ-38 prime mover can burn either straight No. 2 diesel fuel oil or diesel/natural gas.

3.3.1.4. [New] Pump Engine Nos. 3 and No. 4 (EU 018 and 019)

Pump engine Nos. 3 and 4 (EU 003 and 004) began service in August 1951, driving 20 mgd pumps. These engines and pumps were removed and replaced by Caterpillar Model G3512 LE-130 engines coupled to Flowserve Model 16LNC28 high service

Section 3 – Facility Title V Overview (cont.)

pumps under Air Construction Permit 0250314-005-AC, extended under Air Construction Permit 0250314-007-AC. As of July 2005, the new pump engines (EU 018 and 019) have completed initial startup and are undergoing operational testing prior to their initial demonstration of compliance and subsequent normal operation under Title V Air Operation Permit Revision No. 0250314-008-AV.

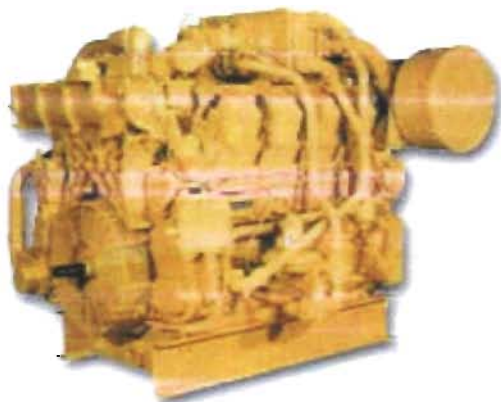


Figure 3-4 Caterpillar G3500 Series Engine

The Model G3512 is in Caterpillar's G3500 engine series that, according to Caterpillar are designed to operate reliably at 900 to 1400 rpm continuously. The Model G3512 LE-130 engine is a V 12 cylinder engine with a Bore & Stroke of 6.7 x 7.5 in. (170 x 190 mm) and displacement of 3158 cu. in. (51.8 liters). This is a turbocharged engine and power output at the design aftercooler operating temperature of 130° F ranges from 610 bhp to 945 bhp.

3.3.2. Other Unregulated Emission Units (EU 021 and 022)

The Alexander Orr, Jr. WTP includes two additional emission units permitted as unregulated; the backup generator for lime recovery plant rated at 250 kW (EU 021) and railcar lime unloading rack (EU 022).

The 250 kW rated diesel-fueled backup generator provides redundant emergency electrical power for critical operation and control functions at the lime recovery plant. It is normally run about 13 hours per year (15 minutes per week) for maintenance purposes only.

The railcar unloading rack provides a means to unload lime from railcars and convey it to the lime storage silos in the event that the lime recovery plant is non-operational for an extended period. The railcar unloads its contents into a hopper located below the rails and a screw conveyor transfers the lime into buckets, which lift the lime to an overhead conveyor for transfer to the silos. The bucket elevator is enclosed and the conveyor system is covered to control fugitive dust emissions and the loss of purchased lime. In practice, however, the facility imports lime when needed by enclosed truck, not railcar, and the lime is pneumatically unloaded directly to the storage bins at the chemical houses, bypassing the lime silos.

3.4. Facility Air Permitting History

Prior to the State of Florida's 1996 implementation of the Title V permitting program under Chapter 62-204 F.A.C. *Air Pollution Control - General Provisions*, the Alexander Orr, Jr. Water Treatment Plant was covered by two separate State Air Operation permits, one for the lime recovery plant and one for the engine-driven pumps. The

Section 3 – Facility Title V Overview (cont.)

standby generators were not permitted because at that time they were only used for emergency backup and limited peak-shaving and were exempt from permitting requirements under FDEP rules.

On June 17, 1996 MDWASD submitted an application to the FDEP for an Initial Title V Air Operation Permit for the facility. In this application the standby generators were considered because a contemporaneous EPA interpretation had stated that “peak-shaving” units could not be considered as exemptible “emergency” generators for Title V permitting purposes. This application requested a limitation of 2000 annual hours of operation per unit for the generators.

Subsequent to that application date, and before a draft permit was issued, MDWASD determined that issues affecting FPL’s ability to deliver uninterrupted power to the facility might necessitate generator usage that exceeded the limits requested in the permit application. It was also determined that the desired increases in standby generator usage would result in a significant net emissions increase for the facility with respect to Chapter 62-213 F.A.C. *Stationary Sources - Preconstruction Review*; § 62-212.400 *Prevention of Significant Deterioration (PSD)*. This provision of the rule required that MDWASD conduct an ambient impact analysis and apply BACT to the standby generators.

On April 22, 1998, MDWASD submitted an application for a Prevention of Significant Deterioration (PSD) air construction permit for the four standby generators to be processed concurrently with the pending application for Initial Title V Air Operation Permit. This application incorporated a cumulative fuel limitation of 1,415,000 gallons per year based on air modeling and a BACT determination for the standby generators requiring the implementation of fuel injection timing retardation (IR) and 4-pass turbocharger aftercooling.

The State of Florida DEP issued Air Construction Permit No. **0250314-002-AC, PSD-FL-249** on July 15, 1999 for the standby generators. All of the standby generators were fully overhauled in 1998 in preparation for increased operation. Four-pass aftercoolers, a component of the proposed BACT, were installed at that time. According to MDWASD records, injection timing retard, the remaining component of BACT, was implemented in April 2000. The engines were next tested for NOx emissions in May of 2000. Initial Title V Air Operation Permit No. **0250314-001-AV** was issued on August 8, 2000.

In the mid-1990's MDWASD began action intended to replace aging engine-driven pump machinery at AOWTP. Most of the engines in the east pump room date back to the 1950's. A Title V Air Construction Permit for the pump room project was first applied for on October 23, 1998 and Air Construction Permit No. **0250314-003-AC** was issued on March 5, 1999. This project was never started as the contractor proposed to install different pumps and engines than those permitted. A new application for the revised engines and pumps was made on April 29, 2002 and Air Construction Permit No. **0250314-005-AC** was issued on October 30, 2002. It was intended that the pump room project be complete by the original permit expiration date of December 31, 2003. Construction delays and contract disputes have extended the project well past that original target date. On December 29, 2003 the project was re-permitted and extended to August 7, 2005 under Air Construction Permit No. **0250314-007-AC**.

Section 3 – Facility Title V Overview (cont.)

Title V Air Operation Permit Revision No. **0250314-004-AV** was issued on September 18, 2002 to make corrections to the general and specific conditions of the permit related to the rotary lime recovery kiln based on corrections to the initial application for Title V air permit and on a reassessment of its regulatory categorization.

Title V Air Operation Permit Revision No. **0250314-008-AV** was issued on May 10, 2005 to incorporate the terms and conditions of Air Construction Permit No. 0250314-005-AC as regards pump engines # 3 and 4 and the pump room emergency generator.

An application for renewal of the Title V air operation permit was submitted on February 4, 2005 and is being processed under FDEP File No. **0250314-010-AV**.

This project is a revision of the application for Title V Air Construction Permit submitted on December 27, 2004 and being processed under FDEP File No. **0250314-009-AC**.

3.5. Facility Category and Rule Applicability

The facility is located in Miami-Dade County, Florida. Chapter 62-204 F.A.C. *Air Pollution Control - General Provisions* "designates all areas of the state as attainment, nonattainment, or unclassifiable with respect to each pollutant for which ambient air quality standards have been adopted; further designates certain attainment and unclassifiable areas of the state as air quality maintenance areas for particular pollutants; classifies all areas of the state as Class I, Class II, or Class III for determining which set of prevention of significant deterioration (PSD) increments apply; and designates all attainment and unclassifiable areas of the state as one or more PSD areas for determining which pollutant--specific PSD baseline dates apply." For this facility the following apply:

1. Attainment and nonattainment areas.

O₃: the entire State is designated as **attainment**.

PM₁₀: the entire State is designated as **unclassifiable**.

SO₂: the entire State is designated as **attainment** except four counties are unclassifiable (Miami-Dade is not one of them).

CO: the entire State is designated as **attainment**.

NO₂: the entire State is designated as **attainment**.

Pb: the entire State is designated as **unclassifiable**.

There are no nonattainment areas.

2. Air Quality Maintenance Areas.

O₃: Miami-Dade County **IS** part of an **AQMA** for ozone.

3. Designation of Prevention of Significant Deterioration Areas.

PM₁₀: the entire State is designated as a **PSD area**.

SO₂: the entire State is designated as a **PSD area** except four counties which were unclassifiable (Miami-Dade is not one of them).

NO₂: the entire State is designated as a **PSD area**.

4. Class I, Class II, or Class III.

The entire State is designated as **Class II** except four National Parks (Everglades IS included) which are designated as Class I.

Section 3 – Facility Title V Overview (cont.)

Chapter 62-210 F.A.C. *Stationary Sources - General Requirements* “establish[es] general requirements for stationary sources of air pollutant emissions [and] . . . provides criteria for determining the need to obtain an air construction or air operation permit.” These criteria and requirements are based on the type of facility, its emissions, and on its location relative to the above classifications.

Absent any restrictions the AOWTP would have the potential to emit 100 tons per year or more of at least one regulated air pollutant, specifically CO and NO_x, as shown in Table 3-2. Therefore the facility is classified as a “Major Source of Air Pollution” or “Title V Source” as defined in Chapter 62-210 F.A.C. *Stationary Sources - General Requirements*. Under a federally-enforceable fuel limit on the standby generators the facility remains a “Major Source of Air Pollution” or “Title V Source” for CO and NO_x, also shown in Table 3-2.

The facility is subject to § 62-210.300 *Permits Required* and therefore is required to “obtain an appropriate permit from the Department prior to beginning construction, modification, or initial or continued operation of the emissions unit.” Under Chapter 62-212 F.A.C. *Stationary Sources - Preconstruction Review*, the facility is therefore subject to § 62-212.300 *General Preconstruction Review Requirements*.

The facility is located in Miami-Dade County, which is designated as “attainment” for O₃, SO₂, CO, and NO₂ so consideration must be given to § 62-212.400 *Prevention of Significant Deterioration (PSD)* when proposing new or modified emissions units at the facility. Since the facility has the potential to emit more than 250 tons per year of NO_x, modifications must be evaluated to determine if they shall be subject to the preconstruction review requirements of the rule.

The proposed increase in standby generator usage proposed in 1998 and permitted in 1999 as Air Construction Permit No. 0250314-002-AC, PSD-FL-249 was subject to the PSD preconstruction review process as the proposed increase in NO_x emissions as a result of the modification constituted a significant net emissions increase for the purposes of the rule. Air modeling was performed and a federally-enforceable fuel use limit of 1,415,000 gallons per year was imposed on the standby generators to limit the impact on off-site ambient receptors to below PSD levels.

The fuel use by the generators proposed under this proposed project would be incorporated in that limit and no change in that limit or in currently permitted potential emissions is sought. The two additional generators are identical to make and model and would be equipped with BACT similar to or better than the existing units. For this reason, and because no more than four standby generators are required to operate the facility under normal conditions, a new PSD preconstruction review has not been performed for the proposed project.

Facility Title V Overview

**Table 3-2 Facility Potential Emissions
Alexander Orr, Jr. Water Treatment Plant
Miami-Dade Water and Sewer Department**

All emission totals are in units of tons per year

	Fuel Used (gal x 10 ³)	CO	NOx	PM ₁₀	SO ₂	VOCs	Acetaldehyde	Acrolein	Benzene	Formaldehyde	Naphthalene	N-Hexane	Toluene	Xylenes	Total HAPs
Lime Recovery Kiln															
Sub-Total		26.49	15.77	11.50	0.19	1.73			0.00	0.02		0.57	0.00		0.59
Pump Room Totals															
Sub-Total		71.06	225.68	3.81	3.07	12.68									
Standby Diesel Generators (no fuel restriction)															
Sub-Total	10,275	595.98	2,921.11	40.33	36.38	59.08	0.02	0.01	0.63	0.06	0.11		0.23	0.16	1.22
Facility Totals (unrestricted)															
Total		693.53	3,162.56	55.64	39.64	73.50	0.02	0.01	0.64	0.09	0.11	0.57	0.23	0.16	1.81
Standby Diesel Generators (fuel-restricted)															
Sub-Total	1,415	82.07	402.26	5.55	5.01	8.14	0.00	0.00	0.07	0.01	0.01		0.03	0.02	0.13
Facility Totals (with permit restrictions)															
Total		179.62	643.71	20.86	8.27	22.55	0.00	0.00	0.07	0.03	0.01	0.57	0.03	0.02	0.73
Based on 138 MMBtu/10 ³ gal and 1050 MMBtu/MMscf															

Proposed Project Information

4.1. Proposed Project Scope

The scope of this project is to install two additional diesel-fueled engine-driven standby generators to an existing bank of four collectively-regulated standby generators of the same manufacturer and model type. Electrical switchgear is in place to accommodate the fifth generator and additional switchgear components will be installed for the sixth.

The emission units proposed by this permit application are:

Table 4-1 Proposed Emission Units	
Emissions Unit No.	Emissions Unit Description
024 (proposed)	Proposed Diesel Engine Generator # 5, EMD model No. 20-645F4B
025 (proposed)	Proposed Diesel Engine Generator # 6, EMD model No. 20-645F4B

4.2. Installation of the Additional Standby Generator Units

MDWASD is proposing to add two new General Motors Electro-Motive Division (EMD) Model 20-645F4B diesel-fueled standby generator sets to the existing bank of four such generators at its Alexander Orr, Jr. WTP in Miami, Florida. MDWASD expects to complete installation and initial compliance testing of proposed generator # 5 within two years of issuance of this requested air construction permit. Proposed generator # 6 and the required switchgear expansion is in the initial planning stage and construction is anticipated to begin within four years of the issuance date of this requested permit.

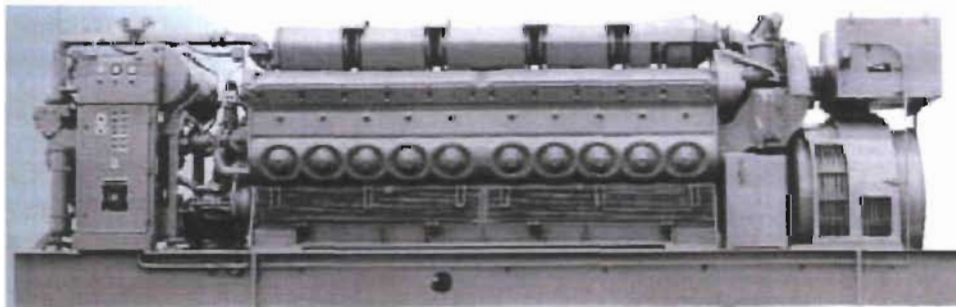


Figure 4-1 General Motors Electro-Motive Division Model 20-645F4B Generator

Each model 20-645F4B 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-fired prime mover. These 2-cycle, 20 cylinder engines are turbocharged and normally operate at 900 revolutions per minute (rpm). They 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 low-sulfur diesel fuel, which has a sulfur content of 0.05 weight percent.

The proposed 20-645F4B generators will be modified at the factory to reduce NO_x emissions. These modifications to the standard 20-645F4B for the control of NO_x emissions consist of utilizing injectors with fixed timing, changing the fuel injection timing, and using 4-pass combustion air aftercoolers to increase intake air cooling. The

Section 4 – Proposed Project Information (cont.)

engines will be fitted with CBOI (constant beginning of injection) injectors by EMD. The standard injector used by EMD is designed so that as engine loads increase, the point at which fuel injection into the cylinder begins is advanced. The CBOI injector has fixed timing and there is no advance based on engine load. The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC) and advances under load. CBOI injectors, as their name implies, have the injection timing fixed at 1 degree BTDC. The intercoolers cool the turbocharged intake air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines are fitted with 4-pass intercoolers. Additionally, the engine will also burn low sulfur (0.05 weight %) diesel fuel, representative of BACT for sulfur dioxide (SO₂). Use of these combustion control techniques is anticipated to reduce the emissions of NOx in the engine exhaust by approximately 28 percent from uncontrolled levels.

The two proposed EMD 20-645F4B standby generator sets are located within individual enclosure structures. Exhaust silencers are mounted horizontally on top of each enclosure structure and the exhaust stacks terminate vertically with a rain cap fitted to the end of the exhaust. The stacks have a 21-inch inside diameter and terminate approximately 21 feet above ground level.

Tables 4-2 and 4-3 summarize the operating characteristics of the proposed and the existing generator sets. Table 4-2 demonstrates that brake-specific fuel consumption (BSFC) increases as the engine loads are decreased.

Table 4-2. Summary of Exhaust and Operating Characteristics of the Proposed EMD Model 20-645F4B Standby Generator Set Miami-Dade WASD Alexander Orr, Jr. WTP	
Number of Units	2 Proposed
Generator Capacity	
Peaking (110% load-2 hours max)	3,150 kW
Continuous (full load-100%)	2,865 kW
Brake Specific Fuel Consumption (lb/bhp-hr)	
Peaking-110%	0.346, each
Full Load-100%	0.346, each
Partial Load-75%	approx. 0.363
Partial Load-50%	approx. 0.381
Operating Speed	900 rpm
Exhaust Characteristics – Vertical Exhaust	
Height	21 ft
Diameter	1.75 ft
Flow	21,350 acfm
	148 fps
Temperature	635°F

Section 4 – Proposed Project Information (cont.)

Table 4-3. Summary of Exhaust and Operating Characteristics of the Existing EMD Model 20-645F4B Standby Generator Sets Miami-Dade WASD Alexander Orr, Jr. WTP	
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%	0.353, each
Full Load-100%	0.353, each
Partial Load-75%	N/A
Operating Speed:	900 rpm
Exhaust Characteristics – Horizontal Exhaust	
Height	18 ft
Diameter	1.75 ft
Flow	23,000 acfm
	148 fps
Temperature	735°F

4.3. Project Emissions

The emissions associated with this project are the typical pollutants from combustion of diesel fuel oil in internal combustion reciprocating engines. The primary pollutants associated with this project are Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Sulfur Oxides (SO_x), Particle Matter (PM), Particle Matter, less than 10 microns (PM₁₀), and Volatile Organic Compounds (VOC).

4.3.1. Potential Emissions

Table 4-3 outlines the potential emissions from the bank of generators including both new and proposed units under the current federally-enforceable fuel limitation. There is no change proposed to this limitation or to potential emissions from those permitted under PSD-FL-249 and Title V Air Operation Permit Revision No. 0250314-008-AV.

The emissions rate for NO_x shown in Table 4-4 is based on manufacturer's data for the base engine with BACT reductions applied as outlined in the application for PSD-FL-249. The SO₂ emissions rate is based on mass balance using low sulfur fuel (0.05% S max.) as required by permit and the remaining rates are based on the EPA Factor Information REtrieval (FIRE) database Version 6.25 for SCC 02-02-004-01 Internal Combustion Engines - Industrial - Large Bore Engine – Diesel.

Proposed Project Information

Table 4-4 EMD 20-645F4B Standby Generator Potential Emissions (fuel restricted)

Existing EU 009 - 012 / Proposed EU 024 - 025

Alexander Orr Water Treatment Plant

Miami-Dade Water and Sewer Department

All emission totals are in units of tons per year and based on 138 MMBtu/10³ gal

Fuel Used (gal x 10 ³)	CO	NOx**	PM ₁₀	SO ₂ ***	VOC	Acetaldehyde	Acrolein	Benzene	Formaldehyde	Naphthalene	Toluene	Xylenes	Total HAPs
Factor	1.16E+02	4.12E+00	7.85E+00	7.08E+00	1.15E+01	2.52E-05	7.88E-06	7.76E-04	7.89E-05	1.30E-04	2.81E-04	1.93E-04	1.49E-03
Units	lb/10 ³ gal	lb/MMBtu	lb/10 ³ gal	lb/10 ³ gal	lb/10 ³ gal	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu	lb/MMBtu
EMD 20-645F4B													
EU 009	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
EU 010	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
EU 011	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
EU 012	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
EU 024*	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
EU 025*	235.83	13.68	67.04	0.93	0.83	1.36	0.00	0.00	0.01	0.00	0.00	0.00	0.02
Total	1,415.00	82.07	402.26	5.55	5.01	8.14	0.00	0.00	0.08	0.01	0.01	0.03	0.15

* EU number as proposed

** NOx emission factors are as currently permitted and requested by MDWASD in the subject application.

*** SO₂ is calculated from fuel specification. Diesel fuel sulfur content (S) = 0.05% by weight; 1 lb. S yields 2 lbs. SO₂.

All other emission factors are taken from EPA FIRE ver. 6.25 for SCC 2-02-004-01 Internal Combustion Engines - Industrial - Large Bore Engine - Diesel.

Air Pollution Control Techniques

5.1. Air Pollution Control Techniques

Emissions from this project are those that typically result from combustion of diesel fuel oil in internal combustion reciprocating engines: NO_x, CO, SO₂, PM/PM₁₀, and VOC. Combustion control is the technique used to control emissions from the two proposed additional diesel engine driven standby generators.

5.2. Air Pollutants

Most of the pollutants from IC engines are emitted through the exhaust. However, some total organic compounds (TOC) escape from the crankcase as a result of blowby (gases that are vented from the oil pan after they have escaped from the cylinder past the piston rings) and from the fuel tank because of evaporation. Nearly all of the TOCs from diesel CI engines enter the atmosphere from the exhaust. Crankcase blowby is minor because TOCs are not present during compression of the charge. Evaporative losses are insignificant in diesel engines due to the low volatility of diesel fuels. In general, evaporative losses are also negligible in engines using gaseous fuels because these engines receive their fuel continuously from a pipe rather than via a fuel storage tank and fuel pump.

The primary pollutants from internal combustion engines are oxides of nitrogen (NO_x), hydrocarbons and other organic compounds, carbon monoxide (CO), and particulates, which include both visible (smoke) and non-visible emissions. Nitrogen oxide formation is directly related to high pressures and temperatures during the combustion process and to the nitrogen content, if any, of the fuel. The other pollutants, HC, CO, and smoke, are primarily the result of incomplete combustion. Ash and metallic additives in the fuel also contribute to the particulate content of the exhaust. Sulfur oxides also appear in the exhaust from IC engines. The sulfur compounds, mainly sulfur dioxide (SO₂), are directly related to the sulfur content of the fuel.

5.2.1. Nitrogen Oxides (NO_x) Emissions

Nitrogen oxide formation occurs by two fundamentally different mechanisms. The predominant mechanism with internal combustion engines is thermal NO_x which arises from the thermal dissociation and subsequent reaction of nitrogen (N₂) and oxygen (O₂) molecules in the combustion air. Most thermal NO_x is formed in the high-temperature region of the flame from dissociated molecular nitrogen in the combustion air. Some NO_x, called prompt NO_x, is formed in the early part of the flame from reaction of nitrogen intermediary species, and HC radicals in the flame. The second mechanism, fuel NO_x, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Gasoline, and most distillate oils, have no chemically-bound fuel N₂ and essentially all NO_x formed is thermal NO_x.

Essentially all NO_x formed in diesel fueled reciprocating engines occurs through the thermal NO_x mechanism. The rate of NO_x formation through the thermal NO_x mechanism is highly dependent upon the stoichiometric ratio, combustion temperature, and residence time at the combustion temperature. Maximum NO_x formation occurs through the thermal NO_x mechanism near the stoichiometric air-to-fuel mixture ratio since combustion temperatures are greatest at this air-to-fuel ratio.

Section 5 – Air Pollution Control Techniques (cont.)

5.2.2. Carbon Monoxide (CO) Emissions

Carbon monoxide is a colorless, odorless, relatively inert gas formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO₂ cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the cylinder is too short. The oxidation rate of CO is limited by reaction kinetics and, as a consequence, can be accelerated only to a certain extent by improvements in air and fuel mixing during the combustion process.

Carbon monoxide is emitted from combustion processes due to incomplete fuel combustion. Incomplete combustion occurs when insufficient oxygen exists near the fuel molecule or when quenching of combustion occurs, thus preventing complete conversion of fuel carbon-to-carbon dioxide. Proper combustion design and operation ensure that CO emissions are minimized. The previous figure also illustrates the effect of fuel to air ratio on CO emissions. CO emissions are lowest under combustion conditions that are slightly lean of the stoichiometric ratio because sufficient oxygen is present for complete oxidation of the fuel carbon while temperature is at its greatest. Under fuel rich conditions, there is not sufficient oxygen for complete combustion. CO emissions increase slightly under the leanest combustion conditions because of lower combustion temperatures and lower fuel mixture flammability.

5.2.3. Sulfur Oxides (SO_x) Emissions

Sulfur oxide emissions are a function of only the sulfur content in the fuel rather than any combustion variables. In fact, during the combustion process, essentially all the sulfur in the fuel is oxidized to sulfur dioxide (SO₂). The oxidation of SO₂ yields sulfur trioxide (SO₃), which reacts with water to give sulfuric acid (H₂SO₄), a contributor to acid rain. Sulfuric acid also reacts with basic substances to give sulfates, which are fine particulates that contribute to PM-10 and visibility reduction.

5.2.4. Particulate Matter (PM/PM₁₀) Emissions

White, blue, and black smoke may be emitted from IC engines. Liquid particulates appear as white smoke in the exhaust during an engine cold start, idling, or low load operation. These are formed in the quench layer adjacent to the cylinder walls, where the temperature is not high enough to ignite the fuel. Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. Proper maintenance is the most effective method of preventing blue smoke emissions from all types of IC engines. The primary constituent of black smoke is agglomerated carbon particles (soot). Particulate matter is formed in internal combustion engines primarily through combustion of fuel oil and lubricating oil. The particulate matter emitted from IC engines will mainly be less than 10 microns in diameter (PM₁₀).

5.2.5. Volatile Organic Compound (VOC) Emissions

In diesel fueled IC engines, hydrocarbon emissions are present in exhaust gas because of incomplete combustion of fuel. Partially burned hydrocarbons can occur because of

Section 5 – Air Pollution Control Techniques (cont.)

poor air and fuel homogeneity due to incomplete mixing, before or during combustion; incorrect air/fuel ratios in the cylinder during combustion due to maladjustment of the engine fuel system; excessively large fuel droplets (diesel engines); and low cylinder temperature due to excessive cooling (quenching) through the walls or early cooling of the gases by expansion of the combustion volume caused by piston motion before combustion is completed. Emissions of VOC are similar to CO emissions: higher at operating conditions richer and leaner than the stoichiometric ratio.

5.3. Emission Controls

EMD controls emissions by controlling combustion process. In the proposed standby generator installation, EMD uses efficient inlet air coolers (also referred to as an intercooler or aftercooler when used to cool compressed air charge from either a turbocharger or blower) to reduce the temperature of the intake air used in combustion to reduce the formation of thermal NO_x emissions.

The proposed additional generators include combustion control modifications to the standard 20-645F4B for the control of NO_x emissions; utilizing injectors with fixed timing, changing the fuel injection timing, and using more efficient combustion air aftercoolers to increase the cooling of the air. The injectors to be used on this engine are called CBOI (constant beginning or injection) injectors by EMD. The standard injector used by EMD is designed so that as engine loads increase, the point at which fuel injection into the cylinder starts advances. The CBOI injector has fixed timing and there is no advance based on engine load. The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC). In order to achieve the proper operation with the CBOI injectors, the timing on these engines is set for 1 degree BTDC. The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NO_x reduction, these engines have 4-pass intercooler. Additionally, the engine will also burn low sulfur (0.05 weight %) diesel fuel, this is representative of BACT for sulfur dioxide (SO₂). 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 these combustion control techniques will reduce the emissions of NO_x in the engine exhaust by approximately 28 percent from uncontrolled levels.

5.4. Compliance Procedures

The initial testing of the proposed fifth and sixth generators will be conducted upon completion of installation, after notification of the FDEP, and submitted to the FDEP for the initial demonstration of compliance with the NO_x RACT emission limitation. Subsequent NO_x emissions testing will be conducted of a unit whenever operated more than 400 hours annually, in accordance with Rule 62-296.570(4)(b)7. The engines are subject to the general visible emissions limitation of less than 20% opacity of Rule 62-296.320(4)(b), F.A.C. and to demonstrate compliance with the visibility limitation, testing will be conducted annually.

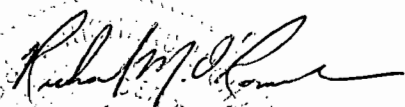
SECTION 6

Conclusion

Based on the foregoing technical evaluation and other available information, the proposed project will comply with all applicable state and federal air pollution regulations. The FDEP should issue a draft permit to MDWASD for the installation of two additional EMD standby generators at the Alexander Orr, Jr. WTP.

This new engines will be subject to the requirements of the facility-wide specific conditions of Section II of the permit. The diesel-fueled engine-driven standby generator bank, including existing and new units, will be subject to an operating limit of 1,415,000 gallons of fuel per year and the NOx emission limitation of 4.12 lb/million BTU.

This evaluation was prepared on June 16, 2005 with staff members of the Miami-Dade Water and Sewer Department by:



21 JUNE 2005

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