MALCOLM PIRNIE

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February 28, 2011

Mr. Jon Holtom, P.E.
Florida Department of Environmental Protection
Bob Martinez Center
2600 Blair Stone Road
Mail Station 5505
Tallahassee, Florida 32399

Re: Request for Additional Information, File Number 0570127-006-AV
Title V Air Operation Permit Renewal Application
McKay Bay Refuse to Energy Facility

Dear Mr. Holtom:

On October 28, 2010, the City of Tampa ("City") submitted a Title V Air Operation Permit renewal application ("Application") to the Florida Department of Environmental Protection ("Department" or "FDEP") for the City's McKay Bay Refuse to Energy Facility ("Facility"). On December 20, 2010, the Department issued a Request for Additional Information ("RAI") concerning the Application. On behalf of the City, Malcolm Pirnie, Inc. ("Malcolm Pirnie") is submitting the following responses to the Department's RAI. The Department's RAI comments are quoted in bold italics, followed by the City's responses ("Responses"). The numbering/lettering designations of the comments and responses reflect the designations provided in the Department's RAI letter.

Department RAI Comment 1:

1. ***Previously submitted information. All renewal applications are required to be treated the same as an initial application for purposes of identifying and certifying compliance with all applicable requirements. For renewal applications, it is not acceptable to reference previously submitted information. To be a complete application, all information must be reviewed, updated, submitted and certified as to its accuracy. The following is a sample of missing information from this renewal application that must be submitted. You should thoroughly review the application to ensure that all of the information necessary to validate the Professional Engineer's and the Responsible Official's certifications is included.***

*a. **Section 1 of 8, Page 26, Box 3: Detailed description of control equipment.***

Revised Page 26 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

*b. **Section 1 of 8, Page 27, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 27 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

c. ***Section 1 of 8, Page 27, Box 3: Alternative Methods of Operation (if applicable). In order to be able to switch between different methods of operation available for operating emissions without first notifying the permitting authority, those available methods must be listed in the permit. Provide a listing and description of all desired/implemented methods of operation.***

Revised Page 27 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

d. ***Section 2 of 8, Page 39, Box 3: Detailed description of control equipment.***

Revised Page 39 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

e. ***Section 2 of 8, Page 40, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 40 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

f. ***Section 2 of 8, Page 40, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 40 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

g. ***Section 3 of 8, Page 52, Box 3: Detailed description of controlled equipment.***

Revised Page 52 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

h. ***Section 3 of 8, Page 53, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 53 of the Application is included with this RAI response letter (See Attachment 1, Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

i. ***Section 3 of 8, Page 53, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 53 of the Application is included with this RAI response letter (See Attachment 1, Section 2 - Application for Air Permit).

j. ***Section 4 of 8, Page 78, Box 3: Detailed description of control equipment.***

Revised Page 78 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

k. ***Section 4 of 8, Page 79, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 79 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

l. ***Section 4 of 8, Page 79, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 79 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

m. ***Section 5 of 8, Page 104, Box 3: Detailed description of control equipment.***

Revised Page 104 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

n. ***Section 5 of 8, Page 105, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 105 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

o. ***Section 5 of 8, Page 105, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 105 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

p. ***Section 6 of 8, Page 130, Box 3: Detailed description of control equipment.***

Revised Page 130 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

q. ***Section 6 of 8, Page 131, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 131 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

r. ***Section 6 of 8, Page 131, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 131 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

s. ***Section 7 of 8, Page 156, Box 3: Detailed description of control equipment.***

Revised Page 156 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 2 for a detailed description of control equipment.

t. ***Section 7 of 8, Page 157, Box 2: Compliance Assurance Monitoring Plan. (see item 2)***

Revised Page 157 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit). Please refer to Attachment 1, Section 4.3, Compliance Assurance Monitoring Plan for revised CAM applicability determinations and potential emissions calculations.

u. ***Section 7 of 8, Page 157, Box 3: Alternative Methods of Operation (if applicable)***

Revised Page 157 of the Application is included with this RAI response letter (See Attachment 1, Revised Section 2 - Application for Air Permit).

v. ***Section 8 of 8, Page 160, Box 3: Detailed description of control equipment and designed drift rate.***

Cooling Tower is an unregulated emissions unit and control equipment description is not applicable.

Department RAI Comment 2:

2. ***Compliance Assurance Monitoring (CAM). CAM applicability had been addressed and described in a previous permitting actions for Unit Nos. 1-4, as not applicable. However, CAM does apply to the MWC Units contained in Permit No. 0570127-002-AC, PSD-FL-086(A) for the controlled emissions of particulate matter (PM) and may apply for other pollutants. Even though the units are exempt from the CAM requirements for the NSPS established emissions limits, they are still potentially subject to the CAM requirements for the prevention of significant deterioration (PSD) established emissions limits. Please propose a CAM plan that will provide reasonable assurances of compliance with the PSD established PM emissions limit. The plan should include the use of COMS and the pressure drop across the baghouse as monitored indicators. Also include CAM applicability determinations and propose CAM plans as applicable for all other pollutants for which an add-on control device is used to comply with the emissions limits.***

Please refer to Attachment 1, which contains the, Section 4.3 Compliance Assurance Monitoring Plan with revised CAM applicability determinations and potential emissions calculations. PSD-FL-086(A) limits PM emissions from the MWC units to 27 mg/dscm, corrected to 7% O_2. The PSD permit implemented the Federal 40 CFR 60, Subpart Cb requirements. The "new" Subpart Cb requirements limit PM emissions to 25 mg/dscm. Therefore, the Federal 40 CFR 60 Subpart Cb governs the regulation of PM, and the Facility Emissions Units 1 - 4 are exempt from CAM requirements for particulate matter. The additional PSD limits for PM (0.0230 lb/MMBtu, 2.76 lb/hr, and 12.1 ton/yr) are equivalents of the previous Federal Subpart Cb PM limit of 27 mg/dscm.

Department RAI Comment 3:

3. ***Equivalency Calculations. It was noted that equivalency calculations were included in the previous renewal application, but they were not evident in this submittal. The dry standard flow rates that were used to show the equivalent allowable emissions in the previous application were listed as 27,289.8 dscfm. The flow rates listed in this application are shown as 36,686 dscfm. Please explain the reason for the increase in the dry standard flow rates and provide the equivalent allowable calculations for all pollutants based on the new Subpart Cb standards.***

Please refer to Attachment 3 – Equivalency Calculations for revised calculations for all pollutants based on the new Subpart Cb standards. The dry standard flow rate for the MWC units has not changed and remains 27,289.8 dscfm. The 36,686 dscfm flow rate shown in the application was incorrectly transcribed during the Application document preparation. The revised Application sections replacing those submitted in the October 28, 2010 Application are provided in Attachment 1, Revised Section 2 – Application Forms.

Department RAI Comment 4:

4. ***Welding Equipment. Please clarify if the portable welding equipment is powered by electrical generation equipment or internal combustion engines. If powered by internal combustion engines, please evaluate each engine for applicability under 40 Code of Regulations (CFR) 63, Subpart ZZZZ and 40 CFR 60, Subparts IIII or JJJJ.***

There is one Miller portable welding machine that is powered by a gasoline engine. However, the engine meets the definition of a "non-road engine" as provided in 40 CFR 1068.30 and is therefore not subject to Subpart ZZZZ. Subparts IIII and JJJJ apply to stationary sources, which are defined in 40 CFR 60.2 as "any building, structure, facility, or

installation which emits or may emit any air pollutant" and are therefore not applicable to the portable welding machine.

We trust that the information presented herein, with the attached supporting documents, provides adequate information and clarification to address each of the Department RAI comments and fulfills the requirements for renewal of the Facility's Title V Air Operation Permit.

Should you have any questions or need additional information, please do not hesitate to contact me at (239) 738-3303 or Tamara Stankunas, Earthshine Environmental, Inc. at (813) 545-7067. We look forward to working with you and the Department.

Very truly yours,

MALCOLM PIRNIE, INC.

Christopher C. Tilman, P.E.
Senior Consultant

Attachments:

1. Revised Section 2: Application for Air Permit & Revised Section 4: Facility Additional Information-Additional Requirements for Title V Air Operations Permit Applications
2. Detailed Description of Control Equipment
3. Equivalency Calculations

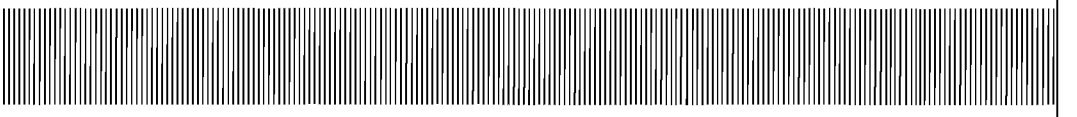
Copies: S. Woodard, Environmental Protection Commission of Hillsborough County
Tonja M. Brickhouse, MPA, Director, City of Tampa
S. Daignault, City of Tampa
N. McCann, City of Tampa
G. Grotecloss, City of Tampa
C. Fletcher, City of Tampa
H. McKnight, Wheelabrator McKay Bay, Inc.
S. Rosania, Malcolm Pirnie, Inc.
C. Tilman, Malcolm Pirnie, Inc.
T. Stankunas, Earthshine Environmental, Inc.

City of Tampa
McKay Bay Refuse-to-Energy Facility
Title V Permit Renewal Application

Attachment 1:

Revised Section 2 – Application for Air Permit

Revised Section 4 – Facility Additional Information - Additional Requirements for Title V Air Operations Permit Applications



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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 an initial, revised or renewal 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. 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 an 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 or 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. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes 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 [8]

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:

   Ash Handling System including scrubber for ash building and scalper building.

3. Emissions Unit Identification Number: 100

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: Tri-Mer Corp. Model Number:

10. Generator Nameplate Rating: MW **Not Applicable**

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description: This emissions unit uses two wet scrubbers and a containment building to control fugitive emissions.
2. Control Device or Method Code: 141, 54

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 280 tons/day (see note 6)	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	7 days/week
52 weeks/year	8,760 hours/year
6. Operating Capacity/Schedule Comment: 280 tons/day maximum process/throughput rate is provided for informational purposes only, and is not a compliance requirement.	

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: See Appendix A		2. Emission Point Type Code: 3
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Ash handling system scrubber stacks		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: V	6. Stack Height: 50 feet	7. Exit Diameter: 1.3 feet
8. Exit Temperature: °F **N/A**	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: % **N/A**
11. Maximum Dry Standard Flow Rate: dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Industrial Processes – Mineral Processes Bulk Materials Conveyors – Other Not Classified		
2. Source Classification Code (SCC): 30510199	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **N/A**
10. Segment Comment:		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

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
VE (Opacity)	**141**	**054**	**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted:	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Not Applicable	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Not Applicable

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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:	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 5 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 2 hours	
4. Method of Compliance: Compliance with opacity emission limits will be demonstrated annually using EPA Reference Method 22.	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the best operational practices to minimize emissions are adhered to and the duration of these events does not exceed 2 hours in any 24-hour period (Rule 62-210.700(1), F.A.C.)	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H 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:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Not Applicable

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Not Applicable	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date:
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

EMISSIONS UNIT INFORMATION
Section [2] of [8]

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:

   Pebble Lime Storage Silos

3. Emissions Unit Identification Number: 101

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW **Not Applicable**

11. Emissions Unit Comment:

Two (2) silos with common vent filter for storage of pebble lime used for acid gas control in SDA units.

EMISSIONS UNIT INFORMATION
Section [2] of [8]

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit is equipped with a fabric filter on the silo exhaust that activates only during silo loading operations.
2. Control Device or Method Code: 18

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 3,300 tons/year	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: hours/day weeks/year	 days/week 500 hours/year

6. Operating Capacity/Schedule Comment:

The vent filter serving the lime silos only activates (exhausts carrier air) during lime loading operations, which occur approximately 500 hours per year. The silos continuously feed lime to the slakers that serve the SDA units.

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: See Appendix A	2. Emission Point Type Code: 2	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: P	6. Stack Height:	7. Exit Diameter:
8. Exit Temperature: °F **Ambient**	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: 1,200 dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Two pebble lime storage silos exhaust through a common vent filter during silo loading operations.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units: Tons transferred or handled	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **N/A**
10. Segment Comment:		

Not Applicable

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

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
PM	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.36 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.015 grains/dscf Reference:	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B)

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.015 grains/dscf	4. Equivalent Allowable Emissions: 0.36 lb/hour tons/year
5. Method of Compliance: The emission unit has the potential to emit less than 100 tons per year and is equipped with a baghouse.	
6. Allowable Emissions Comment (Description of Operating Method): Limited By Florida permit PSD-FL-086(B)	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE05	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 5 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 2 hours	
4. Method of Compliance: EPA Method 9 shall be used to determine opacity compliance pursuant to Chapter 62-297, F.A.C.	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the best operational practices to minimize emissions are adhered to and the duration of these events does not exceed 2 hours in any 24-hour period (Rule 62-210.700(1), F.A.C.)	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H 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:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Not Applicable

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Not Applicable	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

EMISSIONS UNIT INFORMATION
Section [3] of [8]

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:

Activated carbon storage silos

3. Emissions Unit Identification Number: 102

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

[ ] Acid Rain Unit **Not Applicable**

[ ] CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW **Not Applicable**

11. Emissions Unit Comment:
Two (2) activated carbon storage silos used for mercury control in SDA units. Each silo is equipped with a vent filter that operates only during silo loading operations.

EMISSIONS UNIT INFORMATION
Section [3] of [8]

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit is equipped with a fabric filter on each silo exhaust that activates only during silo loading operations.
2. Control Device or Method Code: 18

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 120 tons/year	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
hours/day	days/week
weeks/year	110 hours/year

6. Operating Capacity/Schedule Comment:

The vent filters serving the carbon silos only activate (exhaust carrier air) during carbon loading operations, which occur approximately 110 hours per year. The silos continuously feed activated carbon to the SDA units.

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: See Appendix A	2. Emission Point Type Code: 2	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: P	6. Stack Height:	7. Exit Diameter:
8. Exit Temperature: °F **Ambient**	9. Actual Volumetric Flow Rate: acfm	10. Water Vapor: % **N/A**
11. Maximum Dry Standard Flow Rate: 1,200 dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Each activated carbon storage silo exhausts through a vent filter during silo loading operations.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **N/A**
10. Segment Comment:		

Not Applicable

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

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
PM	**018**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.36 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.015 grains/dscf Reference: PSD-FL-086(B)	7. Emissions Method Code: 5
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B)	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 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: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.015 grains/dscf	4. Equivalent Allowable Emissions: 0.36 lb/hour tons/year
5. Method of Compliance: This emission unit has the potential to emit less than 100 tons per year and is equipped with a baghouse.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B)	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE05	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 5 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 2 hours	
4. Method of Compliance: EPA Method 9 shall be sued to determine opacity compliance pursuant to Chapter 6 -297, F.A.C.	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the best operational practices to minimize emissions are adhered to and the duration of these events does not exceed 2 hours in any 24-hour period (Rule 62-210.700(1), F.A.C.)	

Visible Emissions Limitation: Visible Emissions Limitation __ of ___

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H 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:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

Not Applicable

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Not Applicable	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

EMISSIONS UNIT INFORMATION
Section [4] of [8]

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:

   Municipal Waste Combustors and Auxiliary Burners – Unit No. 1

3. Emissions Unit Identification Number: 103

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: D.B. Riley Model Number: 2753

10. Generator Nameplate Rating: 22.5 MW

11. Emissions Unit Comment:
Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours per occurrence. For CO compliance, the duration of a malfunction period is limited to 15 hours per.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit equipped with a spray dryer absorber (SDA), activated carbon injection system, fabric filter baghouse, and selective non-catalytic reduction (SNCR).
2. Control Device or Method Code: 016, 048, 067, 107

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

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: million 120 MMBtu/hr (see item 6)	
4. Maximum Incineration Rate: pounds/hr 288 tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: 120 MMBtu/hour heat input rate for information purposes only, not for compliance. Maximum steam flow and nominal capacity are limited by Florida permit PSD-FL-086(B).	

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: See Appendix A	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: V	6. Stack Height: 201 feet	7. Exit Diameter: 4.2 feet
8. Exit Temperature: 315 °F	9. Actual Volumetric Flow Rate: 60,894 acfm	10. Water Vapor: 20 % ±
11. Maximum Dry Standard Flow Rate: 27,289.8 dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360.0 North (km): 3091.0	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Four MWCs have separate stacks (flues) located within a common enclosure.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Municipal Incineration – Stationary Mass Burn Waterwall Combustor		
2. Source Classification Code (SCC): 50100105	3. SCC Units: Tons burned (all solid fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **10 ±**
10. Segment Comment: PSD-FL-086(B) limits nominal heat input to 104 MMBtu/hr and nominal capacity to 250 tons per day (rolling 12-month average).		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Auxiliary Fuel/No Emissions – Natural Gas		
2. Source Classification Code (SCC): 50100106	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1027 ±
10. Segment Comment: PSD-FL-086(B) limits the maximum hourly rate by the 10% annual capacity factor.		

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
PM	**016**		**EL**
SO2	**067**	**016**	**EL**
NOx	**107**		**EL**
CO			**EL**
HCL (H106)	**067**	**016**	**EL**
H107	**016**		**EL**
PB	**016**		**EL**
H021	**016**		**EL**
H114	**048**		**EL**
DIOX	**067**	**016**	**EL**
H027	**016**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.55 lb/hour 11.19 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 25 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B).

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emission limit for PM is 27 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 75% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emissions limited to 460 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NOx	2. Total Percent Efficiency of Control:
3. Potential Emissions: 40.1 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 205 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.335 lb/MMBtu. Facility-wide NOx emission limited to 679 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 11.9 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 100 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0995 lb/MMBtu. Facility-wide CO emission limited to 185 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HCL (H106)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 67.9 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 95% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B) limits HCL emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H107 (Fluoride as HF)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.5 lb/hour 6.57 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PB	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.0408 lb/hour 0.179 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.40 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emission limit for lead is 0.44 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H021 (Beryllium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.000115 lb/hour 5.04E-04 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H114 (Mercury Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 0.0223 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.050 mg/dscm or 85% reduction, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:
The current permitted emission limit for mercury is 0.070 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.050 mg/dscm.
Limited by Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: DIOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 30 ng/dscm (total mass), corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H027 (Cadmium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.6E-03 lb/hour 0.0156 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.035 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emission limit for cadmium is 0.040 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.035 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.24E-05 lb/MMBtu.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 25 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 2.55 lb/hour 11.19 tons/year
5. Method of Compliance: Compliance with PM emission limits will be demonstrated annually using EPA Reference Method 5.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for PM is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).	

Allowable Emissions Allowable Emissions 2 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 85% reduction, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Compliance with SO2 emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily geometric average SO2 concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emission limited to 460 tons/year.	

Allowable Emissions Allowable Emissions 3 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 205 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 40.1 lb/hour tons/year
5. Method of Compliance: Compliance with NOx emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily arithmetic average NOx concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide NOx emissions limited to 679 tons/year.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 100 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 11.9 lb/hour tons/year
5. Method of Compliance: Compliance with CO emission limits will be demonstrated via CEMS using a 4-hour block average.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide CO emissions limited to 185 tons/year.	

Allowable Emissions Allowable Emissions 5 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 95% removal, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour 67.9 tons/year
5. Method of Compliance: Compliance with HCL emission limits will be demonstrated annually using EPA Reference Method 26 or 26A.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.	

Allowable Emissions Allowable Emissions 6 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 1.5 lb/hour	4. Equivalent Allowable Emissions: lb/hour 6.57 tons/year
5. Method of Compliance: Compliance with H107 (Fluoride as HF) emission limits will be demonstrated every 5 years using EPA Reference Method 13A or 13B.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 7 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.40 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 0.0408 lb/hour 0.179 tons/year
5. Method of Compliance: Compliance with PB emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for lead is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.	

Allowable Emissions Allowable Emissions 8 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.000115lb/hr	4. Equivalent Allowable Emissions: lb/hour 5.04E-04 tons/year
5. Method of Compliance: Compliance with H021 (Beryllium Compounds) emission limits will be demonstrated every 5 years using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

Allowable Emissions Allowable Emissions 9 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.050 mg/dscm or 85% removal, @ 7% O2	4. Equivalent Allowable Emissions: lb/hour 0.00223 tons/year
5. Method of Compliance: Compliance with H114 (Mercury Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for mercury is 0.050 mg/dscm. Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weigh or volume), corrected to 7% O2, whichever is less stringent.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 10 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 30 ng/dscm (total mass), corrected to 7% O2	4. Equivalent Allowable Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year
5. Method of Compliance: Compliance with DOIX emission limits will be demonstrated annually using EPA Reference Method 23.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.	

Allowable Emissions Allowable Emissions 11 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.035 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 3.60E-03 lb/hour 0.0156 tons/year 3.0E-05 lb/MMBtu
5. Method of Compliance: Compliance with H 027 (Cadmium Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B). The revised 40 CFR 60 Subpart Cb limit for cadmium is 0.035 mg/dscm.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE10	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 3 hours	
4. Method of Compliance: EPA Reference Method 9 shall be used to demonstrate compliance with the opacity limit except as provided under 40 CFR 60.11(e).	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours (40 CFR 60.56(b)).	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor 1 of 3

1. Parameter Code: VE	2. Pollutant(s): Visible Emissions (Opacity)
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Land Model Number: 4500 MK II +	Serial Number: 0095466
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor 2 of 3

1. Parameter Code: EM, TEMP, FLOW	2. Pollutant(s): SO2, O2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 193
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at SDA inlet	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 3 of 3

1. Parameter Code: EM, TMP, FLOW	2. Pollutant(s): O2, NOx, CO, SO2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 197
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

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:

   Municipal Waste Combustors and Auxiliary Burners – Unit No. 2

3. Emissions Unit Identification Number: 104

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: D.B. Riley Model Number: 2754

10. Generator Nameplate Rating: 22.5 MW

11. Emissions Unit Comment:
Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours per occurrence. For CO compliance, the duration of a malfunction period is limited to 15 hours per occurrence.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit equipped with a spray dryer absorber (SDA), activated carbon injection system, fabric filter baghouse, and selective non-catalytic reduction (SNCR).
2. Control Device or Method Code: 016, 048, 067, 107

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

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: million 120 MMBtu/hr (see item 6)	
4. Maximum Incineration Rate: pounds/hr 288 tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: 120 MMBtu/hour heat input rate for information purposes only, not for compliance. Maximum steam flow and nominal capacity are limited by Limited by Florida permit PSD-FL-086(B).	

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: See Appendix A	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: V	6. Stack Height: 201 feet	7. Exit Diameter: 4.2 feet
8. Exit Temperature: 315 °F	9. Actual Volumetric Flow Rate: 60,894 acfm	10. Water Vapor: 20 % ±
11. Maximum Dry Standard Flow Rate: 27,289.8 dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360.0 North (km): 3091.9	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Four MWCs have separate stacks (flues) located within a common enclosure.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Municipal Incineration – Stationary Mass Burn Waterwall Combustor		
2. Source Classification Code (SCC): 50100105	3. SCC Units: Tons burned (all solid fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **10 ±**
10. Segment Comment: PSD-FL-086(B) limits nominal heat input to 104 MMBtu/hr and nominal capacity to 250 tons per day (rolling 12-month average).		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Auxiliary Fuel/No Emissions – Natural Gas		
2. Source Classification Code (SCC): 50100106	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1027 ±
10. Segment Comment: PSD-FL-086(B) limits the maximum hourly rate by the 10% annual capacity factor.		

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
PM	**016**		**EL**
SO2	**067**	**016**	**EL**
NOx	**107**		**EL**
CO			**EL**
HCL (H106)	**067**	**016**	**EL**
H107	**016**		**EL**
PB	**016**		**EL**
H021	**016**		**EL**
H114	**048**		**EL**
DIOX	**067**	**016**	**EL**
H027	**016**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.55 lb/hour 11.19 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 25 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for PM is 27 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 75% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emissions limited to 460 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NOx	2. Total Percent Efficiency of Control:
3. Potential Emissions: 40.1 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 205 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.335 lb/MMBtu. Facility-wide NOx emission limited to 679 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 11.9 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 100 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0995 lb/MMBtu. Facility-wide CO emission limited to 185 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HCL (H106)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 67.9 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 95% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B) limits HCL emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H107 (Fluoride as HF)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.5 lb/hour 6.57 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PB	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.0408 lb/hour 0.179 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.40 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for lead is 0.44 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H021 (Beryllium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.000115 lb/hour 5.04E-04 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H114 (Mercury Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 0.0223 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.050 mg/dscm or 85% reduction, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for mercury is 0.070 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.050 mg/dscm. Limited by Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: DIOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 30 ng/dscm (total mass), corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H027 (Cadmium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.6E-03 lb/hour 0.0156 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.035 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for cadmium is 0.040 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.035 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.24E-05 lb/MMBtu.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 25 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 2.55 lb/hour 11.19 tons/year
5. Method of Compliance: Compliance with PM emission limits will be demonstrated annually using EPA Reference Method 5.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for PM is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).	

Allowable Emissions Allowable Emissions 2 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 75% reduction, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Compliance with SO2 emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily geometric average SO2 concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emission limited to 460 tons/year.	

Allowable Emissions Allowable Emissions 3 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 205 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 40.1 lb/hour tons/year
5. Method of Compliance: Compliance with NOx emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily arithmetic average NOx concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide NOx emissions limited to 679 tons/year.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 100 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 11.9 lb/hour tons/year
5. Method of Compliance: Compliance with CO emission limits will be demonstrated via CEMS using a 4-hour block average.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide CO emissions limited to 185 tons/year.	

Allowable Emissions Allowable Emissions 5 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 95% removal, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour 67.9 tons/year
5. Method of Compliance: Compliance with HCL emission limits will be demonstrated annually using EPA Reference Method 26 or 26A.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.	

Allowable Emissions Allowable Emissions 6 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 1.5 lb/hour	4. Equivalent Allowable Emissions: lb/hour 6.57 tons/year
5. Method of Compliance: Compliance with H107 (Fluoride as HF) emission limits will be demonstrated every 5 years using EPA Reference Method 13A or 13B.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 7 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.40 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 0.0408 lb/hour 0.179 tons/year
5. Method of Compliance: Compliance with PB emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for lead is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.	

Allowable Emissions Allowable Emissions 8 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.000115lb/hr	4. Equivalent Allowable Emissions: lb/hour 5.04E-04 tons/year
5. Method of Compliance: Compliance with H021 (Beryllium Compounds) emission limits will be demonstrated every 5 years using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

Allowable Emissions Allowable Emissions 9 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.050 mg/dscm or 85% removal, @ 7% O2	4. Equivalent Allowable Emissions: lb/hour 0.0223 tons/year
5. Method of Compliance: Compliance with H114 (Mercury Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weigh or volume), corrected to 7% O2, whichever is less stringent. The revised 40 CFR 60 Subpart Cb limit for mercury is 0.050 mg/dscm.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 10 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 30 ng/dscm (total mass), corrected to 7% O2	4. Equivalent Allowable Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year
5. Method of Compliance: Compliance with DOIX emission limits will be demonstrated annually using EPA Reference Method 23.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.	

Allowable Emissions Allowable Emissions 11 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.035 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 3.6E-03 lb/hour 0.0156 tons/year 3.0E-05 lb/MMBtu
5. Method of Compliance: Compliance with H 027 (Cadmium Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B). The revised 40 CFR 60 Subpart Cb limit for cadmium is 0.035 mg/dscm.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE10	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 3 hours	
4. Method of Compliance: EPA Reference Method 9 shall be used to demonstrate compliance with the opacity limit except as provided under 40 CFR 60.11(e).	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours (40 CFR 60.56(b)).	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor 1 of 3

1. Parameter Code: VE	2. Pollutant(s): Visible Emissions (Opacity)
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Land Model Number: 4500 MK II +	Serial Number: 9995460
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor 2 of 3

1. Parameter Code: EM, TEMP, FLOW	2. Pollutant(s): SO2, O2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 186
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at SDA inlet	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 3 of 3

1. Parameter Code: EM, TMP, FLOW	2. Pollutant(s): O2, NOx, CO, SO2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 196
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

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:

   Municipal Waste Combustors and Auxiliary Burners – Unit No. 3

3. Emissions Unit Identification Number: 105

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: D.B. Riley Model Number: 2759

10. Generator Nameplate Rating: 22.5 MW

11. Emissions Unit Comment:
Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours per occurrence. For CO compliance, the duration of a malfunction period is limited to 15 hours per occurrence.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit equipped with a spray dryer absorber (SDA), activated carbon injection system, fabric filter baghouse, and selective non-catalytic reduction (SNCR).
2. Control Device or Method Code: 016, 048, 067, 107

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

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: million 120 MMBtu/hr (see item 6)	
4. Maximum Incineration Rate: pounds/hr 288 tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: 120 MMBtu/hour heat input rate for information purposes only, not for compliance. Maximum steam flow and nominal capacity are limited by Limited by Florida permit PSD-FL-086(B).	

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: See Appendix A		2. Emission Point Type Code: 1
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: V	6. Stack Height: 201 feet	7. Exit Diameter: 4.2 feet
8. Exit Temperature: 315 °F	9. Actual Volumetric Flow Rate: 60,894 acfm	10. Water Vapor: 20 % ±
11. Maximum Dry Standard Flow Rate: 27,289.8 dscfm		12. Nonstack Emission Point Height: Feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360.0 North (km): 3091.9		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Four MWCs have separate stacks (flues) located within a common enclosure.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Municipal Incineration – Stationary Mass Burn Waterwall Combustor		
2. Source Classification Code (SCC): 50100105	3. SCC Units: Tons burned (all solid fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **10 ±**
10. Segment Comment: PSD-FL-086(B) limits nominal heat input to 104 MMBtu/hr and nominal capacity to 250 tons per day (rolling 12-month average).		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Auxiliary Fuel/No Emissions – Natural Gas		
2. Source Classification Code (SCC): 50100106	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1027 ±
10. Segment Comment: PSD-FL-086(B) limits the maximum hourly rate by the 10% annual capacity factor.		

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
PM	**016**		**EL**
SO2	**067**	**016**	**EL**
NOx	**107**		**EL**
CO			**EL**
HCL (H106)	**067**	**016**	**EL**
H107	**016**		**EL**
PB	**016**		**EL**
H021	**016**		**EL**
H114	**048**		**EL**
DIOX	**067**	**016**	**EL**
H027	**016**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.55 lb/hour 11.19 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 25 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for PM is 27 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 75% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emissions limited to 460 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NOx	2. Total Percent Efficiency of Control:
3. Potential Emissions: 40.1 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 205 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.335 lb/MMBtu. Facility-wide NOx emission limited to 679 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 11.9 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 100 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0995 lb/MMBtu. Facility-wide CO emission limited to 185 tons/year.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HCL (H106)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 67.9 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 95% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B) limits HCL emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H107 (Fluoride as HF)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.5 lb/hour 6.57 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PB	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.0408 lb/hour 0.179 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.40 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for lead is 0.44 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H021 (Beryllium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.000115 lb/hour 5.04E-04 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H114 (Mercury Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 0.0223 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.050 mg/dscm or 85% reduction, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for mercury is 0.070 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.050 mg/dscm. Limited by Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: DIOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 30 ng/dscm (total mass), corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H027 (Cadmium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.6E-03 lb/hour 0.0156 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.035 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for cadmium is 0.040 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.035 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.24E-05 lb/MMBtu.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 25 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 2.55 lb/hour 11.19 tons/year
5. Method of Compliance: Compliance with PM emission limits will be demonstrated annually using EPA Reference Method 5.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for PM is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).	

Allowable Emissions Allowable Emissions 2 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 75% reduction, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Compliance with SO2 emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily geometric average SO2 concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emission limited to 460 tons/year.	

Allowable Emissions Allowable Emissions 3 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 205 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 40.1 lb/hour tons/year
5. Method of Compliance: Compliance with NOx emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily arithmetic average NOx concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide NOx emissions limited to 679 tons/year.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 100 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 11.9 lb/hour tons/year
5. Method of Compliance: Compliance with CO emission limits will be demonstrated via CEMS using a 4-hour block average.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide CO emissions limited to 185 tons/year.	

Allowable Emissions Allowable Emissions 5 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 95% removal, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour 67.9 tons/year
5. Method of Compliance: Compliance with HCL emission limits will be demonstrated annually using EPA Reference Method 26 or 26A.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.	

Allowable Emissions Allowable Emissions 6 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 1.5 lb/hour	4. Equivalent Allowable Emissions: lb/hour 6.57 tons/year
5. Method of Compliance: Compliance with H107 (Fluoride as HF) emission limits will be demonstrated every 5 years using EPA Reference Method 13A or 13B.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 7 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.40 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 0.0408 lb/hour 0.179 tons/year
5. Method of Compliance: Compliance with PB emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for lead is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.	

Allowable Emissions Allowable Emissions 8 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.000115lb/hr	4. Equivalent Allowable Emissions: lb/hour 5.04E-04 tons/year
5. Method of Compliance: Compliance with H021 (Beryllium Compounds) emission limits will be demonstrated every 5 years using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

Allowable Emissions Allowable Emissions 9 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.050 mg/dscm or 85% removal, @ 7% O2	4. Equivalent Allowable Emissions: lb/hour 0.0223 tons/year
5. Method of Compliance: Compliance with H114 (Mercury Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weigh or volume), corrected to 7% O2, whichever is less stringent. The revised 40 CFR 60 Subpart Cb limit for mercury is 0.050 mg/dscm.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 10 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 30 ng/dscm (total mass), corrected to 7% O2	4. Equivalent Allowable Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year
5. Method of Compliance: Compliance with DOIX emission limits will be demonstrated annually using EPA Reference Method 23.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.	

Allowable Emissions Allowable Emissions 11 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.035 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 3.6E-03 lb/hour 0.0156 tons/year 3.0E-05 lb/MMBtu
5. Method of Compliance: Compliance with H 027 (Cadmium Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B). The revised 40 CFR 60 Subpart Cb limit for cadmium is 0.035 mg/dscm.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE10	2. Basis for Allowable Opacity: ☑ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 3 hours	
4. Method of Compliance: EPA Reference Method 9 shall be used to demonstrate compliance with the opacity limit except as provided under 40 CFR 60.11(e).	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours (40 CFR 60.56(b)).	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor 1 of 3

1. Parameter Code: VE	2. Pollutant(s): Visible Emissions (Opacity)
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Land Model Number: 4500 MK II +	Serial Number: 0095471
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor 2 of 3

1. Parameter Code: EM, TEMP, FLOW	2. Pollutant(s): SO2, O2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 185
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at SDA inlet	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 3 of 3

1. Parameter Code: EM, TMP, FLOW	2. Pollutant(s): O2, NOx, CO, SO2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 195
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

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:

   Municipal Waste Combustors and Auxiliary Burners – Unit No. 4

3. Emissions Unit Identification Number: 106

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 08/30/2001	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

   [ ] Acid Rain Unit **Not Applicable**

   [ ] CAIR Unit

9. Package Unit:
   Manufacturer: D.B. Riley Model Number: 2760

10. Generator Nameplate Rating: 22.5 MW

11. Emissions Unit Comment:
Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours per occurrence. For CO compliance, the duration of a malfunction period is limited to 15 hours per occurrence.

EMISSIONS UNIT INFORMATION
Section [7] of [8]

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: This emissions unit equipped with a spray dryer absorber (SDA), activated carbon injection system, fabric filter baghouse, and selective non-catalytic reduction (SNCR).
2. Control Device or Method Code: 016, 048, 067, 107

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

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: million 120 MMBtu/hr (see item 6)	
4. Maximum Incineration Rate: pounds/hr 288 tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: 120 MMBtu/hour heat input rate for information purposes only, not for compliance. Maximum steam flow and nominal capacity are limited by Limited by Florida permit PSD-FL-086(B).	

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: See Appendix A	2. Emission Point Type Code: 1	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **Not Applicable**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **Not Applicable**		
5. Discharge Type Code: V	6. Stack Height: 201 feet	7. Exit Diameter: 4.2 feet
8. Exit Temperature: 315 °F	9. Actual Volumetric Flow Rate: 60,894 acfm	10. Water Vapor: 20 % ±
11. Maximum Dry Standard Flow Rate: 27,289.8 dscfm	12. Nonstack Emission Point Height: Feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 360.0 North (km): 3091.9	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Four MWCs have separate stacks (flues) located within a common enclosure.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Municipal Incineration – Stationary Mass Burn Waterwall Combustor		
2. Source Classification Code (SCC): 50100105	3. SCC Units: Tons burned (all solid fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **N/A**	8. Maximum % Ash: **N/A**	9. Million Btu per SCC Unit: **10 ±**
10. Segment Comment: PSD-FL-086(B) limits nominal heat input to 104 MMBtu/hr and nominal capacity to 250 tons per day (rolling 12-month average).		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): Solid Waste Disposal – Government Auxiliary Fuel/No Emissions – Natural Gas		
2. Source Classification Code (SCC): 50100106	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate: See item 10	5. Maximum Annual Rate: See item 10	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 1027 ±
10. Segment Comment: PSD-FL-086(B) limits the maximum hourly rate by the 10% annual capacity factor.		

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
PM	**016**		**EL**
SO2	**067**	**016**	**EL**
NOx	**107**		**EL**
CO			**EL**
HCL (H106)	**067**	**016**	**EL**
H107	**016**		**EL**
PB	**016**		**EL**
H021	**016**		**EL**
H114	**048**		**EL**
DIOX	**067**	**016**	**EL**
H027	**016**		**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PM	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.55 lb/hour 11.19 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 25 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for PM is 27 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: SO2	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 75% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emissions limited to 460 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: NOx	2. Total Percent Efficiency of Control:
3. Potential Emissions: 40.1 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 205 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.335 lb/MMBtu. Facility-wide NOx emission limited to 679 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: CO	2. Total Percent Efficiency of Control:
3. Potential Emissions: 11.9 lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 100 ppmvd, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0995 lb/MMBtu. Facility-wide CO emission limited to 185 tons/year.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: HCL (H106)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 67.9 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 29 ppmvd or 95% removal, corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B) limits HCL emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H107 (Fluoride as HF)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 1.5 lb/hour 6.57 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: PB	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.0408 lb/hour 0.179 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.40 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for lead is 0.44 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H021 (Beryllium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 0.000115 lb/hour 5.04E-04 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: Limited by Florida permit PSD-FL-086(B)	
11. Potential, Fugitive, and Actual Emissions Comment: Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H114 (Mercury Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour 0.0223 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.050 mg/dscm or 85% reduction, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for mercury is 0.070 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.050 mg/dscm. Limited by Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: DIOX	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 30 ng/dscm (total mass), corrected to 7% O2 Reference: PSD-FL-086(B)	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 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 operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: H027 (Cadmium Compounds)	2. Total Percent Efficiency of Control:
3. Potential Emissions: 3.6E-03 lb/hour 0.0156 tons/year	4. Synthetically Limited? ☐ Yes ☑ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: 0.035 mg/dscm, corrected to 7% O2 Reference: Revised 40 CFR 60 Subpart Cb	7. Emissions Method Code: 0
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Limited by revised 40 CFR 60 Subpart Cb and Florida permit PSD-FL-086(B)

11. Potential, Fugitive, and Actual Emissions Comment:

The current permitted emissions limit for cadmium is 0.040 mg/dscm and the revised 40 CFR 60 Subpart Cb limit is 0.035 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.24E-05 lb/MMBtu.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 25 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 2.55 lb/hour 11.19 tons/year
5. Method of Compliance: Compliance with PM emission limits will be demonstrated annually using EPA Reference Method 5.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for PM is 25 mg/dscm. Limited by Florida permit PSD-FL-086(B).	

Allowable Emissions Allowable Emissions 2 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 75% reduction, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: Compliance with SO2 emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily geometric average SO2 concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 25% of the potential sulfur dioxide emission (75% reduction by weight or volume), corrected to 7% O2, whichever is less stringent. Facility-wide SO2 emission limited to 460 tons/year.	

Allowable Emissions Allowable Emissions 3 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 205 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 40.1 lb/hour tons/year
5. Method of Compliance: Compliance with NOx emission limits will be demonstrated via CEMS using EPA Reference Method 19 to calculate the daily arithmetic average NOx concentration.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide NOx emissions limited to 679 tons/year.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 4 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 100 ppmvd, corrected to 7% O2	4. Equivalent Allowable Emissions: 11.9 lb/hour tons/year
5. Method of Compliance: Compliance with CO emission limits will be demonstrated via CEMS using a 4-hour block average.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B). Facility-wide CO emissions limited to 185 tons/year.	

Allowable Emissions Allowable Emissions 5 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 29 ppmvd or 95% removal, corrected to 7% O2	4. Equivalent Allowable Emissions: lb/hour 67.9 tons/year
5. Method of Compliance: Compliance with HCL emission limits will be demonstrated annually using EPA Reference Method 26 or 26A.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits SO2 emissions to 29 ppmvd or 5% of the potential sulfur dioxide emission (95% reduction by weight or volume), corrected to 7% O2, whichever is less stringent.	

Allowable Emissions Allowable Emissions 6 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 1.5 lb/hour	4. Equivalent Allowable Emissions: lb/hour 6.57 tons/year
5. Method of Compliance: Compliance with H107 (Fluoride as HF) emission limits will be demonstrated every 5 years using EPA Reference Method 13A or 13B.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 0.0125 lb/MMBtu.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 7 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.40 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 0.0408 lb/hour 0.179 tons/year
5. Method of Compliance: Compliance with PB emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): The revised 40 CFR 60 Subpart Cb limit for lead is 0.40 mg/dscm. Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 3.76E-04 lb/MMBtu.	

Allowable Emissions Allowable Emissions 8 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.000115lb/hr	4. Equivalent Allowable Emissions: lb/hour 5.04E-04 tons/year
5. Method of Compliance: Compliance with H021 (Beryllium Compounds) emission limits will be demonstrated every 5 years using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 9.58E-07 lb/MMBtu.	

Allowable Emissions Allowable Emissions 9 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.050 mg/dscm or 85% removal, @ 7% O2	4. Equivalent Allowable Emissions: lb/hour 0.0223 tons/year
5. Method of Compliance: Compliance with H114 (Mercury Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B) limits H114 emissions to 0.070 mg/dscm or 15% of the potential mercury emission concentration (85% reduction by weigh or volume), corrected to 7% O2, whichever is less stringent. The revised 40 CFR 60 Subpart Cb limit for mercury is 0.050 mg/dscm.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 10 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 30 ng/dscm (total mass), corrected to 7% O2	4. Equivalent Allowable Emissions: 3.07E-06 lb/hour 1.35E-05 tons/year
5. Method of Compliance: Compliance with DOIX emission limits will be demonstrated annually using EPA Reference Method 23.	
6. Allowable Emissions Comment (Description of Operating Method): Limited by Florida permit PSD-FL-086(B), which also contains additional emission limit of 2.56E-08 lb/MMBtu.	

Allowable Emissions Allowable Emissions 11 of 11

1. Basis for Allowable Emissions Code: RULE	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 0.035 mg/dscm, corrected to 7% O2	4. Equivalent Allowable Emissions: 3.6E-03 lb/hour 0.0156 tons/year 3.0E-05 lb/MMBtu
5. Method of Compliance: Compliance with H 027 (Cadmium Compounds) emission limits will be demonstrated annually using EPA Reference Method 29.	
6. Allowable Emissions Comment (Description of Operating Method): Florida permit PSD-FL-086(B). The revised 40 CFR 60 Subpart Cb limit for cadmium is 0.035 mg/dscm.	

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G 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: VE10	2. Basis for Allowable Opacity: [√] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 10 % Exceptional Conditions: 100 % Maximum Period of Excess Opacity Allowed: 3 hours	
4. Method of Compliance: EPA Reference Method 9 shall be used to demonstrate compliance with the opacity limit except as provided under 40 CFR 60.11(e).	
5. Visible Emissions Comment: Excess emissions are allowed during startup, shutdown, or malfunction, provided that the duration of these events does not exceed 3 hours (40 CFR 60.56(b)).	

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: [ ] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

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

Continuous Monitoring System: Continuous Monitor 1 of 3

1. Parameter Code: VE	2. Pollutant(s): Visible Emissions (Opacity)
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Land Model Number: 4500 MK II +	Serial Number: 9995456
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor 2 of 3

1. Parameter Code: EM, TEMP, FLOW	2. Pollutant(s): SO2, O2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 184
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at SDA inlet	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 3 of 3

1. Parameter Code: EM, TMP, FLOW	2. Pollutant(s): O2, NOx, CO, SO2, Temperature, Steam Flow
3. CMS Requirement:	☑ Rule ☐ Other
4. Monitor Information... Manufacturer: Sick Model Number: MCS100EHW	Serial Number: 194
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: Monitor located at Fabric Filter outlet	

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] Previously Submitted, Date: _
   Test Date(s)/Pollutant(s) Tested: FY 2010 compliance testing results and 2009 Statement of Compliance are included in Appendix D.
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

Alternative Methods of Operation:
No alternative methods of operation are proposed at this time. However, in the unlikely event that a national shortage or delivery interruption of chemicals occurs, the City shall request approval of alternative methods of operation from the FDEP.

EMISSIONS UNIT INFORMATION
Section [8] of [8]

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:

Cooling Tower

3. Emissions Unit Identification Number: 107

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1985	7. Emissions Unit Major Group SIC Code: 49

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit **Not Applicable**

☐ CAIR Unit

9. Package Unit:
Manufacturer: Marley Cooling Tower Co. Model Number: 597-58-2

10. Generator Nameplate Rating: MW **Not Applicable**

11. Emissions Unit Comment:

None

EMISSIONS UNIT INFORMATION
Section [8] of [8]

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Not Applicable

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix B [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, 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)
   [√] Attached, Document ID: See Section 5 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, 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)
   [√] Attached, Document ID: Attachment 2 [ ] Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, 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)
   [√] Attached, Document ID: Appendix C [ ] Previously Submitted, Date _____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [ ] To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   _____
   [√] 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:
   [ ] Attached, Document ID: _____ [√] Not Applicable

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☑ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☑ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☑ Attached, Document ID: See Section 4
2. Compliance Assurance Monitoring: ☑ Attached, Document ID: See Section 4 ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☑ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☑ Not Applicable

Additional Requirements Comment

None

4. Facility Additional Information - Additional Requirements for Title V Air Operations Permit Applications

4.1. List of Insignificant Activities

The process or production units or other pollutant-emitting activities listed below are located at the Facility and are, by virtue of size or operating rate, eligible for treatment as insignificant emission units in accordance with the criteria of Rule 62-213.430(6)(b), F.A.C., and are requested to be treated as such pursuant to Rule 62-213.420(3), F.A.C.

Activity/Source	*Comments*
Paint Usage (less than 6 gal/day)	Meets criteria of Rule 62-213.430(6)(b)
Boiler Water Treatment	Listed as trivial source in USEPA White Paper No.1 (1995)
Cooling Tower Water Treatment	Meets criteria of Rule 62-213.430(6)(b)
Solvent Degreaser	Meets criteria of Rule 62-213.430(6)(b)
Urea Storage Tank	Meets criteria of Rule 62-213.430(6)(b)
Caustic Soda Tank	Meets criteria of Rule 62-213.430(6)(b)
Sulfuric Acid Tank	Meets criteria of Rule 62-213.430(6)(b)
500 Gallon Diesel Fuel Above Ground Storage Tank	Meets criteria of Rule 62-210.300(3)(a)(19)
On-site Vehicular Traffic	Categorically exempt under Rule 62-210.300(3)(a)(2)
Mobile on-site Equipment	Not stationary RICE source, therefore not subject to 40 CFR 63 Subpart ZZZZ.
Refuse Pit	Meets criteria of Rule 62-213.430(6)(b)
Portable Air Compressors	Listed as trivial source in USEPA White Paper No. 1 (1995). Not stationary RICE source, therefore not subject to 40 CFR 63 Subpart ZZZZ.
Portable Welding Machines	Categorically exempt under Rule 62-210.300(3)(a)(13). Not stationary RICE source, therefore not subject to 40 CFR 63 Subpart ZZZZ.
Sandblasting Equipment	Meets criteria of Rule 62-213.430(6)(b). Not stationary RICE source, therefore not subject to 40 CFR 63 Subpart ZZZZ .
250 Gallon Gasoline Above Ground Storage Tank	Meets criteria of Rule 62-210.300(3)(a)(19)

Descriptions and emissions estimates (as necessary) for these insignificant activities/ sources are included on the pages that follow.

4.1.1. Activity Descriptions and Emission Estimate Calculations

4.1.1.1. Paint Usage (less than 6.0 gallons per day)

Paint usage of less than six (6) gallons per day associated with plant maintenance and upkeep activities meets the criteria of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.2. Boiler Water Treatment

Chemicals used in boiler feedwater operations are listed as trivial in the White Paper for Streamlined Development of Part 70 Permit Applications (EPA, 1995) and should be considered insignificant.

4.1.1.3. Cooling Tower Water Treatment

The emissions activity associated with the cooling tower water treatment meets the criteria of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.4. Solvent Degreaser

The facility has a cold cleaner unit in the maintenance area. The degreasing unit satisfies the requirements of Rules 62-210.300(3)(a)(23), F.A.C. and 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.5. Urea Storage Tank

The facility has one 6,000-gallon urea tank for the NOx control system. The tank satisfies the requirements of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.6. Caustic Soda Tank

The emissions activity associated with this tank meets the criteria of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.7. Sulfuric Acid Tank

The facility has one 5,000-gallon sulfuric acid tank on site for water treatment operations. The tank satisfies the requirements of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.8. Diesel Fuel Above Ground Storage Tank

The Facility has one 500-gallon diesel fuel storage tank for refueling mobile on-site equipment and vehicles. The tank is exempt under Rule 62-210.300(3)(a)(19), F.A.C. and should be considered insignificant.

4.1.1.9. On-site Vehicular Traffic

Internal combustion engines in vehicles used for transportation of passengers or freight are exempt from permitting requirements under Rule 62-210.300(3)(a)2, F.A.C.

4.1.1.10. Mobile On-Site Equipment

The on-site mobile equipment at the Facility are powered by reciprocating internal combustion engines (RICE) that meet the definition of non-road engines in 40 CFR 1068.30. They are therefore not stationary RICE sources, and are not subject to the emissions standards in 40 CFR 63 Subpart ZZZZ.

4.1.1.11. Refuse Pit

Refuse pit emissions satisfy the requirements of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant.

4.1.1.12. Portable Air Compressors

Air compressors and pneumatically operated equipment are listed as trivial in the White Paper for Streamlined Development of Part 70 Permit Applications (EPA, 1995) and should be considered insignificant. The portable air compressors at the Facility are powered by reciprocating internal combustion engines (RICE) that meet the definition of non-road engines in 40 CFR 1068.30. They are therefore not stationary RICE sources, and are not subject to the emissions standards in 40 CFR 63 Subpart ZZZZ.

4.1.1.13. Portable Welding Machines

Brazing, soldering or welding equipment is exempt under Rule 62-210.300(3)(a)(13), F.A.C. and should be considered insignificant. The portable welding machines at the Facility are powered by reciprocating internal combustion engines (RICE) that meet the definition of non-road engines in 40 CFR 1068.30. They are therefore not stationary RICE sources, and are not subject to the emissions standards in 40 CFR 63 Subpart ZZZZ.

4.1.1.14. Sandblasting Equipment

Sandblasting equipment satisfies the requirements of Rule 62-213.430(6)(b), F.A.C. and should be considered insignificant. The sandblasting equipment at the Facility are powered by reciprocating internal combustion engines (RICE) that meet the definition of non-road engines in 40 CFR 1068.30. They are therefore not stationary RICE sources, and are not subject to the emissions standards in 40 CFR 63 Subpart ZZZZ.

4.1.1.15. Gasoline Above Ground Storage Tank

The Facility has one 250-gallon diesel fuel storage tank for refueling mobile on-site equipment and vehicles. The tank is exempt under Rule 62-210.300(3)(a)(19), F.A.C. and should be considered insignificant.

4.2. List of Applicable Air Quality Regulations

4.2.1. Federal Regulations

- 40 CFR 50 – National Primary and Secondary Ambient Air Quality Standards
- 40 CFR 52 (All terms and conditions of Florida permit PSD-FL-086(A))
- 40 CFR 60, Subparts A, Cb
- 40 CFR 61 - National Emissions Standards for Hazardous Air Pollutants (NESHAP)
- 40 CFR 64 - Compliance Assurance Monitoring Rule
- 40 CFR 82 – Stratospheric Ozone Protection

4.2.2. Florida Administrative Code (F. A. C.)

- All terms and conditions of Florida Permit PSD-FL-086(B)
- 62-4 – Permits
- 62-4.030
- 62-4.040
- 62-4.050
- 62-4.060
- 62-4.070
- 62-4.080
- 62-4.090
- 62-4.100
- 62-4.120
- 62-4.130
- 62-4.160
- 62-4.210
- 62-204.800(9)(b) – Emissions Guidelines and Compliance Times for Municipal Waste Combustors incorporated by reference
- 62-210 – Stationary Sources - General Requirements
- 62-210.200 – Definitions
- 62-210.300 – Permits Required
- 62-210.300(3) – Exemptions
- 62-210.300(3)(a)13 – Exemption for Brazing, Soldering, or Welding Equipment

- 62-210.300(3)(a)15 – Fire & Safety Equipment
- 62-210.300(3)(a)35 – Exemption for One or More Emergency Generators located within a Single Facility
- 62-210.300(3)(a)36 – Exemption for General Purpose Internal Combustion Engines and Other Reciprocating Internal Combustion Devices
- 62-210.300(5) – Notification of Startup
- 62-210.350 – Public Notice and Comment
- 62-210.360 – Administrative Permit Corrections and Amendments
- 62-210.370(3) – Annual Operating Report
- 62-210.650 – Circumvention
- 62-210.700 – Excess Emissions
- 62-210.900 – Forms and Instructions
- 62-212.400 – Stationary Sources - Preconstruction Review, Prevention of Significant Deterioration (PSD)
- 62-213 – Operation Permits for Major Sources of Air Pollution
- 62-296 – Stationary Sources - Emissions Standards
- 62-296.320 – General Pollutant Emission Limiting Standards
- 62-296.416 – Waste-to-Energy Facilities
- 62-296.416(3) – Mercury Emissions Limiting Standards
- 62-297.310(1) – Required Number of Test Runs
- 62-297.310(2) – Operating Rate During Testing
- 62-297.310(3) – Calculation of Emission Rate
- 62-297.310(4) – Applicable Test Procedures
- 62-297.310(5) – Determination of Process Variables
- 62-297.310(6) – Required Stack Sampling Facilities
- 62-297.310(7) – Frequency of Compliance Tests
- 62-297.310(8) – Test Reports
- 62-297.401 – Compliance Test Methods
- 62-297.620 – Exceptions and Approval of Alternate Procedures and Requirements

4.3. Compliance Assurance Monitoring Plan

On October 3, 1997, EPA promulgated new rules under 40 CFR Part 64 and revised 40 CFR Parts 70 and 71 to implement Compliance Assurance Monitoring (CAM) for major

stationary sources of air pollution that are required to obtain permits under Title V of the Clean Air Act (the "Act"). Subject to certain exemptions, the CAM rule requires owners or operators of such sources to conduct monitoring that satisfies particular criteria provided in the rule to provide a reasonable assurance of compliance with applicable requirements under the Act. The CAM rule applies to all initial Part 70 and 71 permit applications and applications for a significant permit revision submitted after April 20, 1998.

4.3.1. Applicability Determination

The first step in the CAM process is the determination of the applicability of the CAM rules in 40 CFR Part 64 to each pollutant-specific emissions unit ("unit"). Any unit subject to CAM rules must satisfy all of the criteria included in Section 64.2, which include the following:

- The unit must be located at a major source that is required to obtain a Part 70 or 71 permit
- The units is subject to an emission limitation or standard for the applicable pollutant
- The unit uses a control device to achieve compliance with the emission limitation or standard
- Potential pre-control emissions of the applicable pollutant from the unit are at least 100% of major source amount
- The unit is not otherwise exempt

Malcolm Pirnie completed a CAM applicability determination for each unit at the City of Tampa's McKay Bay Refuse to Energy Facility (the "Facility"). The rationale for the determination is presented in the sections that follow. Whenever possible, estimates of potential pre-control emissions were calculated using actual stack test data or emission factors obtained from the EPA's Compilation of Air Emission Factors (AP-42). Potential pre-control emission estimates for pollutants not listed in AP-42 were calculated from stack test data and known (or assumed) control device efficiencies. Post-control estimates for pollutant subject to CAM were based on published emission factors, stack test data, or Continuous Emissions Monitoring System (CEMS) data. Emission factors calculated in the EPA's Compilation of Air Emission Factors (AP-42) assumed a waste HHV of 4,500 Btu/lb. and were corrected for the 5,000 Btu/lb assumption used at the Facility. A summary of the determination results is included as Table 1.

4.3.2. Ash Building and Handling System (Emissions Unit No. 100)

Description

The ash building and handling system consists of the ash conveyors, grizzly scalper, and an enclosed prefabricated metal structure at the terminus of the ash collection system that stores the ash prior to landfilling. Fly ash discharged to the collection system from various points in the combustion trains is wetted to prevent fugitive emissions and mixed with bottom ash. The wet combined ash is then conveyed to the grizzly scalper, where large ferrous metals are removed. The wet ash continues on to the ash building, where smaller ferrous and nonferrous metals are removed. The finished ash is discharged to the ground floor and stored for later transport to the Hillsborough County Southeast Landfill. The ash building is equipped with two wet scrubbers to control particulate emissions.

Particulate (PM/PM10)

The existing Title V operation permit limits particulate emissions from the ash building under Florida permit no. PSD-FL-086(A). The ash building is equipped with a baghouse to control particulate emissions. The pre-control emissions factor for the wetted ash was calculated using the predictive emission factor equation in AP-42 Section 13, *Aggregate Handling and Storage Piles*.

AP-42 references landfill fly ash with 27% moisture content as a typical material used in the predictive equation. The wetted ash stored in the ash building is a similar material, with moisture content ranging from 13-22%. In order to provide a conservative estimate, the largest particle size multiplier (0.74), the lowest moisture content (13%), and an estimated wind speed of 5 mph was used in the equation. Calculations for potential pre-control particulate emissions estimates for the wetted ash are shown on the following page. The estimated potential uncontrolled emissions are below the major source threshold for PM, so the CAM rule does not apply to the ash building at the Facility for particulate emissions.

Opacity (VE)

Opacity is regulated under Florida permit no. PSD-FL-086. However, there is no major source threshold defined for opacity in 40 CFR 60. Therefore, the CAM rule does not apply to the ash building and handling system at the Facility for opacity emissions.

Pre-Control PM Estimate

E = Emission Factor[1]
k = Particle size multiplier (0.74)
U = Mean wind speed (5 mph)
M = Material moisture content (13%)

$$E = k*(0.0032)* \frac{(U/5)^{1.3}}{(M/2)^{1.4}}$$

$$E = 0.74*(0.0032)* \frac{(5/5)^{1.3}}{(13/2)^{1.4}} = 1.72 \text{ E-04 lb./ton}$$

Emission factor x ton conversion x design feed rate[2] x operating time[3] = PM emissions estimate
(1.72 E-04 lb./ton) x (ton/2,000 lb.) x (60 tons/hr.) x (8,760 hrs./yr.) = 0.04 tons/yr.

0.04 tons/yr. < 100 tons/yr. (major source threshold for PM), so CAM rules are not applicable to PM for the ash building.

[1] Emission factor from AP-42, Vol. 1, Chapter 13, predictive emission factor equation 1)
[2] Design feed rate for the ash building is 60 tons per hour.
[3] Operating time is based on 100% availability. Actual operating time is less than 8,760 hours per year

4.3.3. Lime Silos (Emissions Unit No. 101)

Description

The Facility is equipped with two lime storage silos that store pebble lime used in the production of lime slurry for the dry scrubbers. .The silos are equipped with a common fabric vent filter to remove entrained lime from conveying air vented during loading operations.

Particulate (PM/PM10)

Turbulent conditions in the lime silos during loading operations entrain lime particles in the conveying air. As the air moves through the silos, the heavier particles settle out in areas of low air velocity. The remaining particles are removed by the vent filters in the baghouse above the silos. The turbulent conditions that generate particulate emissions only exist in the lime silos when conveying air (and new lime) enters the silos during loading operations. Lime loading operations are only performed at the Facility approximately 6 hours per week, but will be conservatively estimated at 500 hours per year.

The existing Title V operation permit limits particulate emissions from the lime silos under permit no. PSD-FL-086. The silos use a control device (baghouse) to achieve compliance with the particulate emission limitation. Potential pre-control particulate emissions estimates are calculated below.

Pre-Control PM Estimate

Emission Factor[1] x ton conversion x design fill rate[2] x operating time[3] = PM emissions estimate
(0.61 lb./ton) x (ton/2,000 lb.) x (20 tons/hr.) x (500 hrs./yr.) = 3.1 tons/yr.

3.1 tons/yr. < 100 tons/yr. (major source threshold for PM), so CAM rules are not applicable to PM for the lime silo unit.

[1] Uncontrolled Particulate Matter Emission Factor for Lime Product Processing and Handling (from AP-42, Vol. 1, Chapter 11), factor for product loading, enclosed truck.

[2] Lime silo design fill rate used as a conservative estimate. Actual fill rate may be less.

[3] Operating time is based on 500 hours per year. Actual operating time may be less.

Opacity (VE)

Opacity is regulated under Florida permit no. PSD-FL-086. However, there is no major source threshold defined for opacity in 40 CFR 60. Therefore, the CAM rule does not apply to the lime silo at the Facility for opacity emissions.

4.3.4. Activated Carbon Silos (Emissions Unit 102)

Description

The Facility is equipped with two activated carbon storage silos that store activated carbon used for mercury control in the MWC units. Each silo is equipped with a fabric vent filter to remove entrained carbon from conveying air vented during loading operations.

Particulate (PM/PM10)

Turbulent conditions in the carbon silos during loading operations entrain carbon particles in the conveying air. As the air moves through the silos, the heavier particles settle out in areas of low air velocity. The remaining particles are removed by the vent filters in the baghouse above the silos. The turbulent conditions that generate particulate emissions only exist in the carbon silos when conveying air (and new carbon) enters the silos during loading operations. Carbon loading operations are only performed at the Facility approximately 3 hours per month, but will be conservatively estimated at 100 hours per year.

The existing Title V operation permit limits particulate emissions from the carbon silos under permit no. PSD-FL-086. The silos use a control device (baghouse) to achieve compliance with the particulate emission limitation. Potential pre-control particulate emissions estimates are calculated below.

Pre-Control PM Estimate

Emission Factor[1] x ton conversion x design fill rate[2] x operating time[3] = PM emissions estimate
(0.58 lb./ton) x (ton/2,000 lb.) x (20 tons/hr.) x (100 hrs./yr.) = 0.58 tons/yr.

0.58 tons/yr. < 100 tons/yr. (major source threshold for PM), so CAM rules are not applicable to PM for the carbon silo unit.

[1] Uncontrolled Particulate Matter Emission Factor for Carbon Black Manufacture (from AP-42, Vol. 1, Chapter 6), factor for pneumatic system vent, bag filter.

[2] Carbon silo design fill rate used as a conservative estimate. Actual fill rate may be less.

[3] Operating time is based on 100 hours per year. Actual operating time may be less.

Opacity (VE)

Opacity is regulated under Florida permit no. PSD-FL-086. However, there is no major source threshold defined for opacity in 40 CFR 60. Therefore, the CAM rule does not apply to the ash building and handling system at the Facility for opacity emissions

4.3.5. Municipal Waste Combustor Units (Emissions Unit Nos. 103, 104, 105 and 106)

Description

The Facility is equipped with four stationary mass-burn waterwall municipal waste combustor (MWC) units, each rated for a maximum heat input capacity of 120 MMBtu/hr. The heat input capacity is comparable to a feed rate of approximately 288 tons per day at 5,000 Btu/lb. Emissions are controlled on each combustion train by a spray dryer absorber, fabric filter baghouse, powdered activated carbon injection and selective non-catalytic reduction (SNCR) systems. Using lime slurry, the scrubber neutralizes acid-forming gases such as hydrogen fluoride, sulfur dioxide, and hydrogen chloride. Activated carbon is injected into the economizer outlet duct to control mercury emissions. The baghouse captures particulate matter entrained in the flue gas. Captured dry ash particles fall into hoppers where they are discharged to the ash collection system.

All four MWC units are permitted major sources under the existing Title V operations permit No. 0570127-005-AV. The pollutants regulated under that permit and their CAM applicability are shown in Table 1.

Table 1 – CAM Applicability Review Summary

CAM Applicability									CAM Plan Requirements					
Parameter	40 CFR 60 Subpart Cb NSPS Emission Limit	PSD-FL-086 Emission Limit	Test (1) The unit is subject to an emission limitation or standard for the applicable regulated air pollutant (or a surrogate thereof), other than an emission limitation or standard that is exempt under paragraph (b)(1)	Test (2) The unit uses a control device to achieve compliance with any such emission limitation or standard	Test (3) The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source	CAM applicable? If Tests (1), (2), and (3) are all yes, then CAM applies.	Monitored By CEMS	Comments	Monitoring Parameters	Design Pollutant Averaging Period	The unit has the potential to emit, including the effect of control devices, the applicable regulated air pollutant in an amount equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source. If yes, data collection requirements of 40 CFR 64 paragraph b(4)(ii) apply.	Monitoring Frequency	Link to CEMS?	Comments
Ash Building and Handling System (Emissions Unit 100)														
Opacity (VE)		5%	Yes - Regulated under PSD-FL-086	Yes - Wet Scrubbers	No - Major source threshold not defined	No		No major source threshold for opacity						
Lime Storage Silos (Emissions Unit 101)														
Particulate (PM/PM10)		0.015 gr/dscf, up to 0.36 lb/hr.	Yes - Regulated under PSD-FL-086	Yes - Baghouse	No - PTE < 100 tpy	No		Pre-control PTE based on uncontrolled emission factor from AP-42, Volume 1, Chapter 11						
Opacity (VE)		5%	Yes - Regulated under PSD-FL-086	Yes - Baghouse	No - Major source threshold not defined	No		No major source threshold for opacity						
Activated Carbon Storage Silos (Emissions Unit 102)														
Particulate (PM/PM10)		0.015 gr/dscf, up to 0.36 lb/hr.	Yes - Regulated under PSD-FL-086	Yes - Baghouse	No - PTE < 100 tpy	No		Pre-control PTE based on uncontrolled emission factor from AP-42, Volume 1, Chapter 6						
Opacity (VE)		5%	Yes - Regulated under PSD-FL-086	Yes - Baghouse	No - Major source threshold not defined	No		No major source threshold for opacity						
Municipal Waste Combustor Units 1-4 (Emissions Units 103, 104, 105, 106)														
Particulate (PM/PM10)	25 mg/dscm	27 mg/dscm, 0.0230 lb/MMBtu, 2.76 lbs./hr, 12.1 tons/yr per unit.	No - Subpart Cb limits are more restrictive	Yes - Baghouse	Yes - PTE >100 tpy	No		Regulated under Subpart Cb - Exempt						
Opacity (VE)	10%	10%	No - Regulated under Subpart Cb	Yes - Baghouse	No - Major source threshold not defined	No	X	Regulated under Subpart Cb - Exempt						
Cadmium (Cd)	0.035 mg/dscm	3.42E-05 lb/MMBtu, 4.10E-03 lbs./hr, 0.0179 tons/yr	No - Subpart Cb limits are more restrictive	Yes - Baghouse	No - PTE <10 tpy	No		Regulated under Subpart Cb - Exempt						
Lead (Pb)	0.40 mg/dscm	0.44 mg/dscm, 3.76E-04 lb/MMBtu, 0.0451 lbs./hr, 0.197 tons/yr	No - Subpart Cb limits are more restrictive	Yes - Baghouse	Yes - PTE >5 tpy	No		Regulated under Subpart Cb - Exempt						
Mercury (Hg)	0.050 mg/dscm or 15% of potential mercury emission concentration, whichever is less stringent	0.070 mg/dscm, 0.0605 ton/yr.	No - Subpart Cb limits are more restrictive	Yes - Carbon System	No - PTE <10 tpy	No		Regulated under Subpart Cb - Exempt						
Sulfur Dioxide (SO2)	29 ppm or 25% of the potential SO2 emission concentration, whichever is less stringent	29 ppm or 25% of the potential SO2 emission concentration, whichever is less stringent. Facility-wide emissions shall not exceed 460 tons in any consecutive 12-month period.	No - The PSD implements Subpart Cb	Yes - Scrubber	Yes - PTE >100 tpy	No	X	Regulated under Subpart Cb - Exempt						
Hydrogen Chloride (HCl)	29 ppm or 5% of the potential HCl emission concentration, whichever is less stringent	29 ppm or 5% of the potential HCl emission concentration, whichever is less stringent, and 67.9 tons/yr.	No - The PSD implements Subpart Cb	Yes - Scrubber	Yes - PTE >10 tpy	No		Regulated under Subpart Cb - Exempt						
Dioxins/ Furans	For non-electrostatic precipitator controls, 30 ng/dscm	30 ng/dscm, 2.56x10-8 lbs/MMBtu, 3.07x10-6 lbs/hr and 1.35xE-05 tons/year.	Yes - Regulated under Subpart Cb and PSD-FL-086	Yes - Carbon System	No - PTE <10 tpy	No		Pre-control PTE based on uncontrolled emission factor from AP-42, Volume 1, Chapter 2						
Nitrogen Oxides (NOx)	205 ppmv	205 ppmdv, 0.335 lbs/MMBtu, 40.1 lbs/hr. Facility-wide emissions shall not exceed 679 tons in any consecutive 12-month period.	No - The PSD implements Subpart Cb	Yes - Thermal Denox (Urea)	Yes - PTE >100 tpy	No	X	Regulated under Subpart Cb - Exempt						
Carbon Monoxide (CO)	100 ppmv, averaging time is a 4-hour block average.	100 ppmdv on 4 hr block avg, 0.0995 lb/MMBtu, 11.9 lbs/hr. Facility-wide emissions shall not exceed 185 tons in any consecutive 12-month period.	Yes - Regulated under Subpart Cb and PSD-FL-086	No	Yes - PTE >100 tpy	No	X	No control device						
Fluoride (F)		0.0125 lb/MMBtu, 1.5 lbs/hr and 6.57 tons/year per unit.	Yes - Regulated under PSD-FL-086	Yes - Scrubber	No - PTE <10 tpy	No		PTE based on 2010 stack test data and assumed 90% control efficiency						
Beryllium (Be)		9.58E-07 lb/MMBtu, 0.000115 lb/hr and 5.04E-04 tons/yr per unit.	Yes - Regulated under PSD-FL-086	Yes - Baghouse	No - PTE <10 tpy	No		PTE based on 2010 stack test data and assumed 99.9% control efficiency						

Particulate (PM/PM10)

Particulate matter generated during solid waste combustion is comprised of both unburned combustible material and inert material that was present in the solid waste. Turbulent conditions in the combustor entrain this material in the flue gas as fly ash. As the flue gas moves through the boiler and heat recovery equipment, the heavier particles settle out in areas of low gas velocity (i.e. hoppers and scrubbers) and are removed. The remaining particles are removed by the fabric filters in the baghouses.

PSD-FL-086(A) limits PM emissions from the MWC units to 27 mg/dscm, corrected to 7% O_2. The PSD permit implemented the old Federal 40 CFR 60, Subpart Cb requirements. The new Subpart Cb requirements limit PM emissions to 25 mg/dscm, corrected to 7% O_2, which is more restrictive as shown in the calculations below. Therefore, the new Federal 40 CFR 60 Subpart Cb standard governs the regulation of PM, and the Facility is exempt from CAM requirements for particulate matter. The additional PSD limits for PM (0.0230 lb/MMBtu, 2.76 lb/hr, and 12.1 ton/yr) are equivalents of the old 27 mg/dscm Subpart Cb limit.

PM Equivalency Calculations

New PM limit in 40 CFR 60.33b = 25 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(25 mg/dscm) x (g/1000 mg) x (lb/453.59 g) x (dscm/35.31 dscf) x (7,000 gr/lb) = 0.0109 gr/dscf

(25 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)

x (60 min/hr) = 2.55 lb/hr

(2.55 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 11.19 tons/yr

(2.55 lb/hr) / 120 MMBtu/hr = 0.0213 lb/MMBtu

PM limits in PSD-FL-086 = 2.76 lb/hr, 12.1 ton/yr, 0.0230 lb/MMBtu

Opacity (VE)

Opacity is regulated under 40 CFR 60, Subpart Cb and is therefore exempt from the CAM rule.

Cadmium (Cd)

Cadmium is a trace metal found in many components of solid waste, and is volatilized during combustion. Cadmium will solidify in the cooler areas of the heat recovery equipment by condensing on the surface of entrained particles in the flue gas or will form particulate itself. These particles are carried in the flue gas stream to the baghouse,

where they settle out by gravity or are captured on the filter bag surface and removed. Therefore, the capture of particulate matter in the baghouse results in the capture of cadmium.

PSD-FL-086(A) limits Cd emissions from the MWC units to 0.040 mg/dscm, corrected to 7% O_2. The PSD permit implemented the old Federal 40 CFR 60, Subpart Cb requirements. The new Subpart Cb requirements limit Cd emissions to 0.035 mg/dscm, corrected to 7% O_2, which is more restrictive as shown in the calculations below. Therefore, the new Federal 40 CFR 60 Subpart Cb standard governs the regulation of Cd, and the facility is exempt from CAM requirements for cadmium. The additional PSD limits for Cd (3.42E-05 lb/MMBtu, 4.1E-03 lb/hr, and 0.0179 ton/yr) are equivalents of the old 0.040 mg/dscm Subpart Cb limit.

Cd Equivalency Calculations

New Cd limit in 40 CFR 60.33b = 0.035 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(0.035 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)

x (60 min/hr) = 0.0036 lb/hr

(0.0036 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.0156 tons/yr

(0.0036 lb/hr) / 120 MMBtu/hr = 0.000030 lb/MMBtu

Cd limits in PSD-FL-086 = 3.42E-05 lb/MMBtu, 4.1E-03 lb/hr, and 0.0179 ton/yr

Lead (Pb)

Lead is a trace metal found in most components of solid waste, and is readily volatilized during combustion. Lead vapor will solidify in the cooler areas of the heat recovery equipment by condensing on the surface of entrained particles in the flue gas or will form particulate itself. These particles are carried in the flue gas stream to the baghouse, where they settle out by gravity or are captured on the filter bag surface and removed. Therefore, the capture of particulate matter in the baghouse results in the capture of lead. A fraction of the lead remains as fine particulate and will escape capture in the control device.

PSD-FL-086(A) limits Pb emissions from the MWC units to 0.44 mg/dscm, corrected to 7% O_2. The PSD permit implemented the old federal 40 CFR 60, Subpart Cb lead requirement. The new Subpart Cb requirements limit Pb emissions to 0.40 mg/dscm, corrected to 7% O_2, which is more restrictive as shown in the calculations below. Therefore, the Federal 40 CFR 60 Subpart Cb standard governs the regulation of Pb, and

the facility is exempt from CAM requirements for lead. The additional PSD limits for lead (3.76E-04 lb/MMBtu, 0.0451 lb/hr, and 0.197 ton/yr) are equivalents of the old Federal limit.

Pb Equivalency Calculations

New Pb limit in 40 CFR 60.33b = 0.40 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(0.40 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)

x (60 min/hr) = 0.0408 lb/hr

(0.0408 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.179 tons/yr

(0.0408 lb/hr) / 120 MMBtu/hr = 0.00034 lb/MMBtu

Pb limits in PSD-FL-086(A) = 0.0451 lb/hr, 0.197 ton/yr, 0.000376 lb/MMBtu

Mercury (Hg)

Mercury is also a trace metal found in solid waste that is readily volatilized during combustion. Mercury vapor condenses on the surface of entrained particles in the flue gas, especially fine particulates because of the high surface area to volume ratio. Activated carbon is injected into the scrubber to provide a fine particulate surface on which the mercury vapor can adsorb or condense, which effectively removes mercury from the flue gas. The mercury-laden particles are then carried in the flue gas stream to the baghouse, where they settle out by gravity or are captured on the filter bag surface and removed. Therefore, the capture of particulate matter in the baghouse results in the capture of mercury. A very small fraction of the mercury remains as fine particulate and will escape capture in the control device.

PSD-FL-086(A) limits Hg emissions from the MWC units to 0.070 mg/dscm, corrected to 7% O_2. The PSD permit implemented the old federal 40 CFR 60, Subpart Cb mercury requirement. The new Subpart Cb requirements limit Hg emissions to 0.050 mg/dscm, corrected to 7% O_2, which is more restrictive as shown in the calculations below. Therefore, the Federal 40 CFR 60 Subpart Cb standard governs the regulation of Hg, and the facility is exempt from CAM requirements for mercury.

Hg Equivalency Calculations

New Hg limit in 40 CFR 60.33b = 0.050 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(0.050 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)

x (60 min/hr) = 0.0051 lb/hr

(0.0051 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.0223 tons/yr

(0.0051 lb/hr) / 120 MMBtu/hr = 0.0000425 lb/MMBtu

Sulfur Dioxide (SO_2)

Sulfur dioxide formation is a function of the chemical form and content of sulfur in the solid waste fuel. Sulfur occurs in organic and inorganic forms and usually converts to SO_2 during combustion. A small amount of SO_2 generated during solid waste combustion is further oxidized to SO_3, which combines with water to form sulfuric acid (H_2SO_4) mist, or SAM. SAM is discussed later as a separate pollutant.

Flue gas containing sulfur dioxide enters the dry scrubbers, where it comes in contact with finely atomized alkaline (lime) slurry. The alkaline slurry chemically reacts with the sulfur dioxide in the flue gas, forming neutralized calcium compounds that settle out in the scrubber hopper or are captured on the baghouse filters.

PSD-FL-086(A) limits SO_2 emissions from the MWC units to 29 ppmdv corrected to 7% O_2 or 75% reduction by weight or volume, whichever is greater. The PSD permit implements the federal Subpart Cb requirements, so Subpart Cb governs the regulation of SO_2 at the facility. Therefore, the facility is exempt from CAM requirements for sulfur dioxide.

Hydrogen Chloride (HCl)

Hydrogen chloride forms during the combustion of solid waste. The amount of HCl formed during combustion depends on the amount of chlorine-containing materials (i.e. salts, PVC, etc.) present in the solid waste.

Flue gas containing hydrogen chloride enters the dry scrubbers, where it comes in contact with finely atomized alkaline (lime) slurry. The alkaline slurry chemically reacts with the HCl in the flue gas, forming neutralized calcium compounds that settle out in the scrubber hopper or are captured on the baghouse filters.

PSD-FL-086(A) limits HCl emissions from the MWC units to 29 ppmdv corrected to 7% O2 or 95% reduction by weight or volume, whichever is greater. The PSD permit

implements the federal Subpart Cb requirements, so Subpart Cb governs the regulation of HCl at the facility. Therefore, the facility is exempt from CAM requirements for hydrogen chloride.

Dioxins/Furans (PCDD/PCDF)

Dioxins/furans (or MWC organics) are two groups of structurally similar compounds that contain 210 isomers. The chemical, physical, and toxicological characteristics of each isomer vary relative to its chemical structure, but some of the isomers are highly toxic.

Dioxin and furan formation can be minimized by maintaining good combustion practices in combination with scrubbers and fabric filters. The Facility uses scrubbers and fabric filters, but also injects activated carbon into the scrubber, which promotes further removal of dioxins and furans.

The existing Title V operation permit limits dioxin/furan emissions from the MWC units under 40 CFR 60, Subpart Cb and permit no. PSD-FL-086. The MWC units use control devices (scrubber and baghouse) to achieve compliance with the lead emission limitation. However, the pre-control dioxin/furan emissions estimate is below the major source threshold, so the CAM rule does not apply to the MWC units at the Facility for dioxin/furan emissions. The potential pre-control emissions estimate calculation is shown below.

Pre-Control CDD/CDF Estimate

Emission factor[1] Btu conversion
(1.67 E-06 lb./ton) x (5,000/4,500) = (1.85 E-06 lb./ton)

Emission Factor x ton conversion x design feed rate[2] x operating time[3] = CDD/CDF emissions estimate
(1.85 E-06 lb./ton) x (ton/2,000 lb.) x (12 tons/hr.) x (8,760 hrs./yr.) = 0.00009 tons/yr.

0.00009 tons/yr. < 10 tons/yr. (major source threshold for CDD/CDF), so CAM rules are not applicable to CDD/CDF for all MWC units.

[1] Uncontrolled CDD/CDF Factor for Mass Burn Combustors (from AP-42, Vol. 1, Chapter 2) used a heating value of 4,500 Btu/lb. The Facility reference waste heating value is 5,000 Btu/lb.

[2] MWC design feed rate used as a conservative estimate. Actual feed rate may be less.

[3] Operating time is based on 100% availability. Actual operating time is less than 8,760 hours per year.

Nitrogen Oxides (NO_x)

Nitrogen oxides are products of all conventional combustion processes. NO_x forms during the combustion of solid waste through two mechanisms, thermal NO_x and fuel NO_x. Thermal NO_x is formed by high temperature oxidation of nitrogen in the combustion air, and fuel NO_x is formed by the oxidation of nitrogen in the solid waste.

Because of the temperatures at which MWC units operate, 70-80% of NO_x formed is fuel NO_x.

The Facility uses a Selective Non-Catalytic Reduction (SNCR) system to control NO_x concentration in the flue gas. The system injects a mixture of air and urea into the boiler above the stoker grate. The urea reacts with NO_x in the gas path, resulting in the formation of elemental nitrogen, carbon dioxide, and water.

NO_x emissions from each MWC unit are regulated under 40 CFR 60, Subpart Cb and Florida permit no. PSD-FL-086(A). The Subpart Cb requirements limit NO_x emissions to 205 ppmdv, corrected to 7% O_2, which is above the major source threshold of 100 tons/yr for each unit as shown in the calculations below. However, the City of Tampa uses the existing nitrogen oxide CEMS system to demonstrate compliance with the permit limits, thereby exempting NO_x from CAM requirements under 40 CFR 64.2(b)(vi).

Nitrogen Oxides (NOx) Equivalency Calculation

NO_x limit in 40 CFR 60.33b = 205 ppmdv, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(27,289.8 dscfm) x (60 min/hr) x (205 parts/10^6 parts) x (46.01 lb/lb-mole)

x (1 lb-mole/385.3 dscf) = 40.08 lb/hr

(40.08 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 175.5 tons/yr

(40.08 lb/hr) / 120 MMBtu/hr = 0.334 lb/MMBtu

Carbon Monoxide (CO)

Carbon Monoxide is formed by the incomplete oxidation of carbon compounds in fuel. Some carbon monoxide is formed during all combustion processes where carbon-containing fuel is used. However, the amount of carbon dioxide formed is dependent upon the combustion efficiency of the fuel–burning process. Incomplete oxidation can be caused by several factors, including:

- Fuel-rich conditions (low oxygen)
- Poor fuel-air mixing
- Low combustion temperature
- Short combustion zone residence time

Carbon monoxide formation can be effectively controlled by designing the combustor to provide an adequate supply of combustion air and maximizing combustion efficiency. The Facility's MWC units control CO through good combustion design and operational practices.

CO emissions from each MWC unit are regulated under 40 CFR 60, Subpart Cb and Florida permit no. PSD-FL-086(A). The Facility does not use a control device to achieve compliance with emission limitations, so the CAM rule does not apply to the MWC units at the Facility for carbon monoxide emissions.

Fluoride (F)

Fluoride production during solid waste combustion is a function of the fluorine content of the waste (primarily in fluorinated plastics and other fluorocarbons), combustion temperature, and thermally driven chemical reactions between the combustion air and the fluorine-containing wastes. Fluorides are highly soluble in water and can be effectively controlled by contact with the finely atomized alkaline (lime) slurry in the dry scrubber.

The existing Title V operation permit limits fluoride emissions from the MWC units under Florida permit no. PSD-FL-086(A). The MWC units use a control device (scrubber) to achieve compliance with the fluoride emission limitation. Potential pre-control fluoride emissions estimates are calculated below. No fluoride emission factors were published in AP-42, so the most recent (2010) stack test data for fluoride was used in conjunction with an assumed scrubber control efficiency of 90% to obtain the pre-control emission estimate.

Assuming 90% control efficiency, the pre-control fluoride emission estimate is below the major source threshold. Therefore, the CAM rule does not apply to the MWC units at the Facility for fluoride emissions. The potential pre-control fluoride emissions estimate calculation is shown below.

Pre-Control F Estimate

Emission rate[1] x ton conversion x operating time[2] x scrubber efficiency factor = F emissions estimate
(0.0037 lb./hr.) x (ton/2,000 lb.) x (8,760 hrs./yr.) x (100/100-90) = 0.16 tons/yr.

0.16 tons/yr. < 10 tons/yr. (major source threshold for F), so CAM rules are not applicable to F for the MWC units.

[1] Maximum fluoride emissions rate from 2010 stack test.

[2] Operating time is based on 100% availability. Actual operating time is less than 8,760 hours per year.

Beryllium (Be)

Beryllium is a metal found only in trace quantities in solid waste, and is much less volatile than lead or mercury. Therefore, most of the beryllium in the solid waste will be retained in the bottom ash after combustion. Small amounts of beryllium vapor will solidify in the cooler areas of the heat recovery equipment by condensing on the surface of entrained particles in the flue gas. These particles are carried in the flue gas stream to the baghouse, where they settle out by gravity or are captured on the filter bag surface and removed. Therefore, the capture of particulate matter in the baghouse results in the capture of beryllium. A small fraction of the beryllium remains as fine particulate and will escape capture in the control device.

Beryllium emissions from each MWC unit are regulated under 40 CFR 60, Subpart Cb and Florida permit no. PSD-FL-086(A). The MWC units use a control device (baghouse) to achieve compliance with the beryllium emission limitation. Potential pre-control beryllium emissions estimates are calculated below. No beryllium emission factors were published in AP-42, so the most recent (2010) stack test data for beryllium was used in conjunction with an assumed scrubber control efficiency of 99.9% to obtain the pre-control emission estimate. Malcolm Pirnie has no data on dry scrubber control efficiencies for beryllium, but an efficiency assumption of 99.9% produces a very conservative estimate of pre-control emissions.

Assuming 99.9% control efficiency, the pre-control beryllium emission estimate is below the major source threshold. Therefore, the CAM rule does not apply to the MWC units at the Facility for beryllium emissions. The potential pre-control beryllium emissions estimate calculation is shown below.

Pre-Control Be Estimate

Emission rate[1] x ton conversion x operating time[2] x scrubber efficiency factor = Be emissions estimate
(2.06 E-06 lb./hr.) x (ton/2,000 lb.) x (8,760 hrs./yr.) x (100/100-99.9) = 0.009 tons/yr.

0.009 tons/yr. < 10 tons/yr. (major source threshold for Be), so CAM rules are not applicable to Be for the MWC units.

[1] Maximum beryllium emissions rate from 2010 stack test.

[2] Operating time is based on 100% availability. Actual operating time is less than 8,760 hours per year.

4.4. Requested Changes to Title V Air Operating Permit

The following administrative error corrections are requested to the current Title V Air Operating Permit:

Page 1 of Statement of Basis, last paragraph: "*Emissions from the silos are controlled by baghouses*" should be changed to "*Emissions from the silos are controlled by* ***a baghouse***."

Page 51, Section III, Subsection C: *"Lime from the spray dryer absorbers for each municipal waste combustor is stored in two silos. Emissions from the silos are controlled by a baghouse."*

The silos share a common vent filter. This information was correctly stated in the Facility's Title V Renewal Application, dated December 27, 2005.

Page 45, III. B. Emissions Unit- 100 Ash Building and Handling System: "*Since the estimated potential uncontrolled PM emissions are below the major source threshold, the CAM rule does not apply to the ash transfer and storage system's baghouse*" should be changed to "*Since the estimated potential uncontrolled PM emissions are below the major source threshold, the CAM rule does not apply to the ash transfer and storage system's* ***scrubber***." The Ash Management Building and Handling System has always been equipped with two wet scrubbers, as was stated in the Facility's Title V Renewal Application, dated December 27, 2005.

City of Tampa
McKay Bay Refuse-to-Energy Facility
Title V Permit Renewal Application

Attachment 2:

Detailed Description of Control Equipment

0043047 / FTM

MALCOLM PIRNIE

City of Tampa
McKay Bay Refuse to Energy Facility Retrofit Project
Operation & Maintenance Manual

II. GENERAL DESCRIPTION

City of Tampa
McKay Bay Refuse to Energy Facility Retrofit Project
Operation & Maintenance Manual

II. GENERAL DESCRIPTION

Wheelabrator Air Pollution Control has supplied the following major components for the City of Tampa McKay Bay Refuse to Energy Facility Retrofit Project.

- A Spray Dryer Absorber/Fabric Filter (SDA/FF) Dry Scrubbing System with Absorbent Preparation System and Powdered Activated Carbon (PAC) Injection, to control acid gas, solid particulates, heavy metal and dioxin/furan emissions from the four refuse fired boilers.

- A Selective Non Catalytic Reduction (SNCR) System to control Nitrogen Oxide (NO_x) formation in the boiler.

- A Continuous Emissions Monitoring (CEM) to monitor the performance of the two above systems and provide the required compliance data.

1.0 SUMMARY

1.1 Dry Scrubbing System

The Dry Scrubbing System has been designed to provide acid gas (SO_2, HCl), solid particulate (dust), heavy metal and dioxin/furan control from each of four (4) refuse fired boilers. The Dry Scrubbing System consists of a Spray Dryer Absorber (SDA) and a Fabric Filter (FF) for each boiler.

Flue gas enters the top of each SDA. Lime slurry is atomized into the flue gas in the SDA. The fine spray droplets absorb acid gases (SO_2, HCl) from the flue gas. The heat of the flue gas evaporates the slurry water creating a solid particle. The flue gas is then ducted to a fabric filter where the fly ash from the boiler and the dried reaction products from the SDA are collected. Additional acid gas removal occurs as the flue gas passes through the dust on the fabric filter bags. Two lime slurry preparation systems are provided to prepare the lime slurry. Redundant slakers are provided to mix the pebble lime with city water and make the lime slurry ($Ca(OH)_2$). The slurry is stored in redundant lime slurry storage tanks and pumped through a complete re-circulation loop to the four SDA's. Wastewater from the plant is piped to a dilution water tank and pre-softened with some of the lime slurry. This water is also pumped to the SDA'S. The

evaporation of the slurry water in the SDA cools the flue gas. This causes heavy metals and dioxin/furans that exist as vapors at the SDA inlet to condense.

To further enhance the collection of mercury and dioxin/furans, powdered activated carbon (PAC) will be injected upstream of each SDA. The PAC adsorbs additional mercury and dioxin/furans. Two PAC injection systems are provided, one for each pair of boilers. PAC is stored in a silo and is fed to three (2 operating /1 spare) feeder/educator assemblies for each pair of boilers. The educator pneumatically conveys the PAC to the SDA inlet ductwork where is it injected it into the boiler flue gas.

1.2 SNCR NOx Control System

The SNCR NO_x Control System injects a urea-based solution (NO_xOUT A) into the boiler to reduce nitrogen oxide emissions to nitrogen and water. NO_xOUT A is a mixture of urea and proprietary chemicals. It is stored in a common storage tank. A circulation module pumps the solution to four metering modules, one per boiler. The metering individual modules mix a controlled amount of concentrated solution with dilution water. The diluted reagent is then pumped to four distribution modules. The reagent is then transported to eight injector nozzles per boiler where compressed air is added to atomize the solution. The air / reagent mixture is injected into the boiler off gas above the boiler overfire air ports. The dilute urea decomposes and then reacts with the NO_x to form harmless nitrogen gas.

1.3 Continuous Emission Monitoring System

A Continuous Emission Monitoring System is utilized to measure, record and report the performance of the individual boiler trains and their emission control systems to the local Environmental Authorities. Table 1.3 summarizes the data that will be collected. A dedicated multi-component analyzer will be supplied for the inlet of each SDA and the outlet of each FF. An in situ opacity monitor will be installed at each fabric filter outlet. The analyzers are a "Hot-Wet" extractive design. A representative flue gas sample is extracted, filtered and conveyed by heated sampling lines to the analyzer. The analyzer will also be heated to prevent condensation of the moisture in the sample. The outlet test stations are also equipped with opacity monitors. The analyzers are located in an enclosure along with the Data Acquisition System. Sulfur Dioxide (SO_2) and Nitrogen Oxides (NO_x) signals are fed back via the DCS to the Dry Scrubbing and SNCR Systems. These signals will be used to adjust lime slurry flow (Dry Scrubbing) and NOxOut Solution (SNCR) feed to maintain compliance.

The CEM System is supplied by Aldora. Please refer to their manual for additional information and operating instructions.

Table 1.3 CEM Measurement Data

SDA Inlet		
CO_2	0-20%	Dgb
SO_2	0-600	ppm-dgb
CO (Low)	0-100	ppm-dgb
CO (High)	0-2,000	ppm-dgb
H_2O	0-25%	wgb
O_2	0-25%	wgb
FF Outlet		
CO_2	0-20%	dgb
SO_2	0-150	ppm-dgb
NO_x	0-400	ppm-dgb
H_2O	0-25%	wgb
O_2	0-25%	wgb
Opacity	0-100%	
Recorded Process Parameters	SDA Outlet Temperature PAC Feeder Speed Boiler Stream Flow	

2.0 DRY SCRUBBING SYSTEM

The Dry Scrubbing System is designed to provide HCl, SO_2 and acid gas, solid particulate, heavy metal and dioxin/furan control. Calcium hydroxide slurry ($Ca(OH)_2$) is atomized into the flue gas using a Spray Dryer Absorber (SDA). See process flow diagrams, drawings 04-21-3-001 and 002. Acid gases are absorbed by the slurry, while the heat of the flue gas evaporates the slurry water, and cools the flue gas. The cooled gas is directed to a fabric filter where solid particulates (fly ash and dried reaction products) are collected. Cooling the flue gas promotes the condensation of heavy metals (mercury, cadmium, lead) and dioxin/furans, allowing them to be captured as a solid or aerosol in the fabric filter. Powdered Activated Carbon (PAC) is pneumatically injected upstream of the SDAs. The PAC adsorbs mercury and dioxin/furans from the flue gas.

Design Removal/Emission levels are:

SO_2	Least stringent of 29 $ppm_{v\text{-}dgb}$ @ 7% O_2 (24 hr geometric mean) outlet concentration - or - 80% removal (24 hr geometric mean)
HCl	Least stringent of 25 $ppm_{v\text{-}dgb}$ @ 7% O_2 outlet concentration - or - 95% removal
Solid Particulate	Outlet concentration less than 0.010 gr/dscf @ 7% O_2 (24 mg/dscm)
Opacity (%)	Less than 10% (6 min avg.)
PCDD/PCDF	Outlet concentration less than 13 ng/DSCM @ 7% O_2 total PCDD/PCDF
Mercury	Least stringent of 85% removal or an outlet concentration less than 70 µg/DSCM @ 7% O_2
Lead	Outlet concentration less than 0.20 mg/DSCM @ 7% O_2
Cadmium	Outlet concentration less than 0.020 mg/DSCM @ 7% O_2

2.1 Process Description

2.1.1 Acid Gas Control

Flue gas is ducted from each boiler's economizer to the top of a dedicated spray dryer absorber. An atomized calcium hydroxide ($Ca(OH)_2$) slurry is used to absorb SO_2 and HCl from the flue gas (see Drawings No. 04-21-3-001 and 002). The slurry and a controlled amount of dilution water are mixed and then atomized with compressed air and injected into the flue gas. The SO_2 and HCl are absorbed by the atomized slurry droplets. The SO_2 reacts with the $Ca(OH)_2$ to form calcium sulfite ($CaSO_3 \bullet \frac{1}{2}H_2O$). Some of the calcium sulfite is further oxidized to calcium sulfate ($CaSO_4 \bullet H_2O$) by oxygen in the boiler off gas. The HCl reacts with the $Ca(OH)_2$ to form $CaCl_2$. Trace amounts of HF produced by the boiler are also absorbed and solid CaF_2 is produced.

Evaporation of the slurry water in the droplets occurs simultaneously with these reactions. The absorption of SO_2 and HCl continues after the droplet has dried and a solid particle is formed. The flue gas and solid particulate are then directed to a fabric filter where the solid materials are collected from the flue gas. The efficiency of the process is improved as the spray dryer absorber exit temperature decreases and approaches the saturation temperature. A lower exit temperature increases the time required to dry the slurry droplet, thereby increasing the reaction time of the more efficient liquid absorption step. The amount of lime slurry and dilution water that is introduced to the process is controlled to obtain maximum SO_2 and HCl removal, while producing a dry product. The system will be designed to operate, at an outlet temperature setpoint between 275° and 315°F at design conditions. The initial recommended set point is 285°F. The spray dryer absorber is designed to provide eleven (11) seconds residence time, based on the design boiler load of 100 MM BTU/hr and 485°F SDA inlet temperature.

The selected outlet temperature is also critical for the collection of dioxin/furans and heavy metals. WAPC's experience indicates that a maximum outlet temperature of 350°F is required to optimize collection of all the specified heavy metals. $CaCl_2$ is deliquescent, or in English it means that it will absorb water. Operation at too low of a SDA outlet temperature will cause the dust to clump and become sticky, creating ash handling problems. Once the $CaCl_2$ has absorbed more water, the dust also become more corrosive.

Additional SO_2 and HCl removal occurs in the fabric filter as the flue gas passes through the filter cake layer on the filter's bags. The fabric filter cleaning sequence is designed to maintain maximum filter cake on the bags to improve acid gas removal in the fabric filter and minimize lime consumption. The cleaning cycle will also be designed to operate based on pressure drop initiated cleaning, with a maximum time interval override. The pressure drop initiation maximizes the time dust is retained on the fabric, for acid gas capture, compared with a straight time interval. The timer override minimizes the upsets that can occur with a rapid increase in boiler load. Cleaning frequency, if based on pressure drop, decreases at lower boiler loads, increasing the thickness of the built up filter cake. If there is a step

change increase in load, there will be a corresponding large increase in pressure drop. This can require the rapid cleaning of several compartments to maintain the pressure drop setpoint, thereby exposing several compartments of cloth with little or no filter cake to the flue gas.

2.1.2 Heavy Metal and Dioxin/Furan Control

There are specific heavy metal emission limits for mercury (Hg), cadmium (Cd) and lead (Pb). The primary mechanism for heavy metal and dioxin/furan is condensation in the SDA and collection of the subsequent aerosol in the fabric filter. Collection is primarily dependent on fine (sub-micron) particulate collection, and to a lesser degree, SDA outlet temperature. Dioxin/Furan control temperature dependence is insignificant once threshold temperatures are reached. Dioxin/furan and mercury capture improves little as the SDA exit temperature is decreased from 350° to 230°F.

Mercury emissions are present as elemental mercury and mercuric chloride. The elemental mercury is present as a vapor and very little is condensed and collected at the proposed SDA outlet temperatures. Elemental mercury and mercuric chloride collection is improved with the introduction of Powdered Activated Carbon (PAC) into the flue gas upstream of the SDA. Mercury and Mercuric Chloride are adsorbed into the pore structure of the activated carbon. The PAC also improves Dioxin/Furan capture.

PAC is metered into a venturi type educator that pneumatically conveys the material to the ductwork upstream of the flue gas SDA where it is injected into the flue gas. The separate injection system provides a steady flow of PAC, independent of the SDA operation.

For each of the two boilers, there are two PAC silos. There are 3 blowers for each set of two boilers (2 operating/1 spare).

2.1.3 Design Basis

Table 2.1.1 lists the range design conditions at the inlet of the Spray Dryer Absorber (SDA). The SDA has been designed for a maximum slurry water feed rate of 15 gpm. This corresponds approximately to boiler operation at 100 MM BTU/hr at 100% excess air and SDA inlet/outlet temperatures of 485/285 °F.

Tables 2.1.2 thru 2.1.4 show flow rates and temperatures, at steady state operation for the following conditions.

TABLE	BOILER LOAD	SO_2/HCl CONCENTRATION	INLET TEMPERATURE
2.1.2	100% MCR	90% UCl	485
2.1.3	75% MCR	90% UCl	465
2.1.4	110% MCR	Average	495

Tables 2.1.2 thru 2.1.4 show flow rates and temperatures, at steady state operation for the following conditions.

Table 2.1.1 SDA Inlet Design Parameter (per Boiler)

Boiler Load	100 MM BTU/HR		
Flue Gas Flow Rate	146,670 lb/hr 36,701 SCFM 63,487 ACFM		
Temperature @ Full Load (1) Minimum Temperature	495°F 485°F		
Maximum Acid Gas and Particulate at Inlet			
	99% UCL (2) Max. Removal Design	**90% UCl Lime System Design**	**Mean**
SO_2 lb/hr	122	77	100
ppm(v-dgb)@7%O_2	526	77	302
HCl lb/hr	197	143	170
ppm(v-dgb)@7%O_2	1482	981	1232
HF lb/hr	2	3	3
ppm(v-dgb)@7%O_2	34	34	34
Solid Particulate lb/hr	528	576	552
gr/sdcf@7%O_2	2.6	2.6	2.6

(1) Return to Figure 2.1.1 to determine maximum temperature at reduced load operation.

(2) UCL - Upper Confidence Limit; eg. 90% UCL: Concentration/flow will be below limit 90% of time.

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Absorbent Preperation System Mass Balance

Boiler # 1; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL
Boiler # 2; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL
Boiler # 3; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL
Boiler # 4; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL

	L1 Slaker Water	L2 Slaker Discharge	L3 Lime Tank Out	L4 Lime Pump Out	L5 Lime to Dil H2O Tank	L6 Lime Pump Return	L7 H2O to Dil H2O Tank	L8 Dil H2O Tank Out	L9 Dil H2O Pump Out	L10.1 Lime Slurry to SDA-1	L10.2 Lime Slurry to SDA-2	L10.3 Lime Slurry to SDA-3	L10.4 Lime Slurry to SDA-4	L11.1 Dil H2O to SDA-1	L11.2 Dil H2O to SDA-2
lb/min H2O	33.6	69.6	366.5	374.8	9.2	296.9	406.1	415.3	415.3	17.2	17.2	17.2	17.2	93.5	93.5
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Ca(OH)2	0.0	20.3	97.6	97.6	2.4	77.3	0.0	2.4	2.4	4.5	4.5	4.5	4.5	0.5	0.5
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	0.0	1.4	6.6	6.6	0.2	5.2	4.1	4.3	4.3	0.3	0.3	0.3	0.3	1.0	1.0
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min subtotal solids	0.0	21.6	104.1	104.1	2.6	82.5	4.1	6.7	6.7	4.8	4.8	4.8	4.8	1.5	1.5
lb/min total	33.6	91.2	470.6	479.0	11.8	379.4	410.2	422.0	422.0	22.0	22.0	22.0	22.0	95.0	95.0
wt % moisture	100.0	76.3	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0
wt% solids	0.0	23.7	22.1	21.7	21.7	21.7	1.0	1.6	422.0	21.7	21.7	21.7	21.7	1.6	1.6
GPM	4.0	9.4	49.0	50.0	1.2	39.6	48.9	50.1	50.1	2.3	2.3	2.3	2.3	11.3	11.3

	L11.3 Dil H2O to SDA-3	L11.4 Dil H2O to SDA-4	L12.1 Slurry Feed to SDA-1	L12.2 Slurry Feed to SDA-2	L12.3 Slurry Feed to SDA-3	L12.4 Slurry Feed to SDA-4	L13 Dil H2O to Slaker	L14 Total Contact H2O	S1 Peb Lime to Slaker	S2 Slaker Grit Discharge	SW1 Lime Pump Seal H2O	SW2-Excess Lime Pump Seal H2O	SW3 Dil Pump Seal H2O	SW4-Final Strainer Flush H2O
lb/min H2O	93.5	93.5	110.7	110.7	110.7	110.7	41.4	447.5	0.2	0.3	8.3	8.3	0	0
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.3	0.0	0.0	0.0	0	0
lb/min Ca(OH)2	0.5	0.5	5.0	5.0	5.0	5.0	0.2	0.2	0.2	0.0	0.0	0.0	0	0
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.2	0.0	0.0	0.0	0	0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
lb/min Inerts	1.0	1.0	1.3	1.3	1.3	1.3	0.4	4.5	1.9	1.0	0.0	0.0	0	0
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
lb/min subtotal solids	1.5	1.5	6.3	6.3	6.3	6.3	0.6	4.8	17.3	1.0	0.0	0.0	0	0
lb/min total	95.0	95.0	116.9	116.9	116.9	116.9	42.0	452.2	17.4	1.3	8.3	8.3	0	0
wt % moisture	0.0	0.0	0.0	0.0	0.0	0.0	98.5	98.5	17.1	1.0	0.0	0.0	0	0
wt% solids	1.6	1.6	5.4	5.4	5.4	5.4	1.5	2.5	17.3	1.3	0.0	0.0	100	100
GPM	11.3	11.3	13.6	13.6	13.6	13.6	5.0	53.9	1.0	25.0	1.0	1.0	0	0

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Table 2.1.2 Dry Scrubbing System Mass Balance
100% MCR; 80%EA; Dirty Boiler; 90% UCL

	F1 SDA Inlet	F2 SDA Inleak	F3 SDA Atom Air	F4 SDA Out	F5 FF Leak	F6 FF Out	S3 SDA Discharge	S4 FF Discharge
lb/min CO2	339.4	0.0	0.0	339.4	0.0	339.4	0.0	0.0
lb/min O2	221.6	11.9	6.0	239.5	13.6	253.1	0.0	0.0
lb/min N2	1,635.0	39.4	19.7	1,694.1	45.0	1,739.2	0.0	0.0
lb/min H2O	246.4	0.7	0.3	358.0	0.8	358.7	0.1	0.1
lb/min SO2	1.17	0.00	0.00	0.35	0.00	0.23	0.00	0.00
lb/min HCl	2.17	0.00	0.00	0.22	0.00	0.11	0.00	0.00
lb/min HF	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lb/min SO3	0.05	0.00	0.00	0.05	0.00	0.01	0.00	0.00
lb/min subtotal fluegas	2,445.8	52.0	26.0	2,631.6	59.4	2,690.8	0.0	0.0
lb/min Ca(OH)2	0.0	0.0	0.0	1.6	0.0	0.0	0.4	1.3
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	1.3	0.0	0.0	0.3	1.6
lb/min CaCl2	0.0	0.0	0.0	2.4	0.0	0.0	0.6	2.5
lb/min CaF2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
lb/min Inerts	0.0	0.0	0.0	0.8	0.0	0.0	0.2	0.8
lb/min ash	8.8	0.0	0.0	7.0	0.0	0.0	1.8	7.0
lb/min subtotal solids	8.8	0.0	0.0	13.1	0.0	0.0	3.4	13.3
lb/min total	2454.6	52.0	26.0	2644.8	59.4	2690.8	3.4	13.4
SCFM	33,454	701	350	36,846	801	37,645	0	0
SDCFM	28,177	686	343	29,180	784	29,962	0	0
ACFM	60,672	691	60	52,842	789	54,532	0	0
vol % CO2	8.89	0.00	0.00	8.07	0.00	7.90	0.00	0.00
vol % O2	7.98	20.50	20.50	7.83	20.50	8.10	0.00	0.00
vol % N2	67.27	77.40	77.40	63.29	77.40	63.59	0.00	0.00
vol % H2O	15.77	2.10	2.10	20.81	2.10	20.41	0.00	0.00
ppm (v-wgb) SO2	210	0	0	57	0	37	0	0
ppm (v-wgb) HCl	684	0	0	62	0	30	0	0
ppm (v-wgb) HF	24	0	0	2	0	2	0	0
ppm (v-wgb) SO3	7	0	0	7	0	1	0	0
gr/scf	1.831	0.000	0.000	2.492	0.000	0.006	0.000	0.000
gr/acf	1.010	0.000	0.000	1.738	0.000	0.004	0.000	0.000
ppm (v-dgb) SO2 @7% O2	303	0	0	91	0	61	0	0
ppm (v-dgb) HCl @7% O2	988	0	0	99	0	49	0	0
ppm (v-dgb) HF @7% O2	34	0	0	3	0	3	0	0
ppm (v-dgb) SO3 @7% O2	10	0	0	10	0	1	0	0
gr/sdcf @7% O2	2.644	0.000	0.000	3.971	0.000	0.010	0.000	0.000
deg F	489	60	120	285	60	277	0	0
deg F	148	66	87	147	20	146	20	0
Tdp deg F	130	65	65	141	19	140	19	0
Pa (in Hg)	29.65	29.90	192.73	29.44	29.90	28.85	0.00	0.00
Ps (in Wg)	-3.30	0.00	0.00	-6.15	0.00	-14.15	0.00	0.00

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Absorbent Preperation System Mass Balance

Boiler # 1; Case # 9; 100% MCR; 80%EA; Clean Boiler; 50% UCL
Boiler # 2; Case # 9; 100% MCR; 80%EA; Clean Boiler; 50% UCL
Boiler # 3; Case # 9; 100% MCR; 80%EA; Clean Boiler; 50% UCL
Boiler # 4; Case # 9; 100% MCR; 80%EA; Clean Boiler; 50% UCL

	L1 Slaker Water	L2 Slaker Discharge	L3 Lime Tank Out	L4 Lime Pump Out	L5 Lime to Dil H2O Tank	L6 Lime Pump Return	L7 H2O to Dil H2O Tank	L8 Dil H2O Tank Out	L9 Dil H2O Pump Out	L10.1 Lime Slurry to SDA-1	L10.2 Lime Slurry to SDA-2	L10.3 Lime Slurry to SDA-3	L10.4 Lime Slurry to SDA-4	L11.1 Dil H2O to SDA-1	L11.2 Dil H2O to SDA-2
lb/min H2O	20.2	41.8	369.1	377.4	6.5	327.2	286.0	292.5	292.5	10.9	10.9	10.9	10.9	66.9	66.9
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Ca(OH)2	0.0	12.2	91.7	91.7	1.6	79.5	0.0	1.6	1.6	2.7	2.7	2.7	2.7	0.4	0.4
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	0.0	0.8	6.2	6.2	0.1	5.4	2.9	3.0	3.0	0.2	0.2	0.2	0.2	0.7	0.7
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min subtotal solids	0.0	13.0	97.9	97.9	1.7	84.9	2.9	4.6	4.6	2.8	2.8	2.8	2.8	1.1	1.1
lb/min total	20.2	54.8	467.0	475.3	8.2	412.1	288.9	297.0	297.0	13.8	13.8	13.8	13.8	67.9	67.9
wt % moisture	100.0	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
wt% solids	0.0	23.7	21.0	20.6	20.6	20.6	1.0	1.5	1.5	20.6	20.6	20.6	20.6	1.5	1.5
GPM	2.4	5.6	49.0	50.0	0.9	43.4	34.4	35.3	35.3	1.4	1.4	1.4	1.4	8.1	8.1

	L11.3 Dil H2O to SDA-3	L11.4 Dil H2O to SDA-4	L12.1 Slurry Feed to SDA-1	L12.2 Slurry Feed to SDA-2	L12.3 Slurry Feed to SDA-3	L12.4 Slurry Feed to SDA-4	L13 Dil H2O to Slaker	L14 Total H2O	L15 Lime Slurry to Ash cond.	S1 Peb Lime to Slaker	S2 Grit Discharge	SW1 Lime Pump Seal H2O	SW2-Excess Lime Pump Seal H2O	SW3 Dil Pump Seal H2O	SW4-Final Strainer Flush H2O
lb/min H2O	66.9	66.9	77.8	77.8	77.8	77.8	24.9	310.8	22.2	0.1	0.2	8.3	8.3	0.0	0.0
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0
lb/min Ca(OH)2	0.4	0.4	3.0	3.0	3.0	3.0	0.1	0.1	6.5	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	0.7	0.7	0.9	0.9	0.9	0.9	0.3	3.2	0.4	1.1	0.6	0.0	0.0	0.0	0.0
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min subtotal solids	1.1	1.1	3.9	3.9	3.9	3.9	0.4	3.3	6.9	10.3	0.6	0.0	0.0	0.0	0.0
lb/min total	67.9	67.9	81.7	81.7	81.7	81.7	25.2	314.1	29.1	10.4	0.8	8.3	8.3	0.0	0.0
wt % moisture	0.0	0.0	0.0	0.0	0.0	0.0	98.5	98.5	76.3	1.0	25.0	0.0	0.0	0.0	0.0
wt% solids	1.5	1.5	4.8	4.8	4.8	4.8	1.5	2.5	23.7	99.0	75.0	0.0	0.0	100.0	100.0
GPM	8.1	8.1	9.5	9.5	9.5	9.5	3.0	37.4	3.0	0.0	0.0	1.0	1.0	0.0	0.0

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Table 2.1.2 Dry Scrubbing System Mass Balance
100% MCR; 80%EA; Clean Boiler; 50% UCL

	F1 SDA Inlet	F2 SDA Inleak	F3 SDA Atom Air	F4 SDA Out	F5 FF Leak	F6 FF Out	S3 SDA Discharge	S4 FF Discharge
lb/min CO2	339.4	0.0	0.0	339.4	0.0	339.4	0.0	0.0
lb/min O2	221.6	11.9	6.0	239.5	13.6	253.1	0.0	0.0
lb/min N2	1,635.0	39.4	19.7	1,694.1	45.0	1,739.2	0.0	0.0
lb/min H2O	246.4	0.7	0.3	325.2	0.8	325.9	0.1	0.1
lb/min SO2	0.67	0.00	0.00	0.20	0.00	0.13	0.00	0.00
lb/min HCl	1.33	0.00	0.00	0.13	0.00	0.07	0.00	0.00
lb/min HF	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lb/min SO3	0.05	0.00	0.00	0.05	0.00	0.01	0.00	0.00
lb/min subtotal fluegas	2,444.5	52.0	26.0	2,598.6	59.4	2,657.8	0.0	0.0
lb/min Ca(OH)2	0.0	0.0	0.0	1.0	0.0	0.0	0.2	0.8
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.8	0.0	0.0	0.2	1.0
lb/min CaCl2	0.0	0.0	0.0	1.4	0.0	0.0	0.4	1.5
lb/min CaF2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
lb/min Inerts	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.6
lb/min ash	8.8	0.0	0.0	7.0	0.0	0.0	1.8	7.0
lb/min subtotal solids	8.8	0.0	0.0	10.8	0.0	0.0	2.8	10.9
lb/min total	2453.3	52.0	26.0	2609.3	59.4	2657.9	2.8	11.0
SCFM	33,442	701	350	36,141	801	36,941	0	0
SDCFM	28,165	686	343	29,178	784	29,961	0	0
ACFM	56,849	691	60	51,686	789	53,347	0	0
vol % CO2	8.89	0.00	0.00	8.23	0.00	8.05	0.00	0.00
vol % O2	7.98	20.50	20.50	7.98	20.50	8.25	0.00	0.00
vol % N2	67.30	77.40	77.40	64.52	77.40	64.80	0.00	0.00
vol % H2O	15.78	2.10	2.10	19.27	2.10	18.89	0.00	0.00
ppm (v-wgb) SO2	120	0	0	33	0	22	0	0
ppm (v-wgb) HCl	421	0	0	39	0	19	0	0
ppm (v-wgb) HF	24	0	0	2	0	2	0	0
ppm (v-wgb) SO3	7	0	0	7	0	1	0	0
gr/scf	1.832	0.000	0.000	2.085	0.000	0.006	0.000	0.000
gr/acf	1.077	0.000	0.000	1.458	0.000	0.004	0.000	0.000
ppm (v-dgb) SO2 @7% O2	173	0	0	52	0	35	0	0
ppm (v-dgb) HCl @7% O2	608	0	0	61	0	30	0	0
ppm (v-dgb) HF @7% O2	34	0	0	3	0	3	0	0
ppm (v-dgb) SO3 @7% O2	10	0	0	10	0	1	0	0
gr/sdcf @7% O2	2.646	0.000	0.000	3.260	0.000	0.010	0.000	0.000
Tdb deg F	432	60	120	285	60	277	0	0
Twb deg F	146	66	87	144	20	144	20	0
Tdp deg F	130	65	65	138	19	137	19	0
Pa (in Hg)	29.73	29.90	192.73	29.52	29.90	28.93	0.00	0.00
Ps (in Wg)	-2.20	0.00	0.00	-5.05	0.00	-13.05	0.00	0.00

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Absorbent Preperation System Mass Balance

Boiler # 1; Case # 15; 100% MCR; 80%EA; Dirty Boiler; 50% UCL; SDA Off-Line
Boiler # 2; Case # 15; 100% MCR; 80%EA; Dirty Boiler; 50% UCL; SDA Off-Line
Boiler # 3; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL
Boiler # 4; Case # 8; 100% MCR; 80%EA; Dirty Boiler; 90% UCL

	L1 Slaker Water	L2 Slaker Discharge	L3 Lime Tank Out	L4 Lime Pump Out	L5 Lime to Dil H2O Tank	L6 Lime Pump Return	L7 H2O to Dil H2O Tank	L8 Dil H2O Tank Out	L9 Dil H2O Pump Out	L10.1 Lime Slurry to SDA-1	L10.2 Lime Slurry to SDA-2	L10.3 Lime Slurry to SDA-3	L10.4 Lime Slurry to SDA-4	L11.1 Dil H2O to SDA-1	L11.2 Dil H2O to SDA-2
lb/min H2O	16.8	34.8	370.1	378.5	4.5	335.4	198.9	203.4	203.4	0.0	0.0	7.1	7.1	0.0	0.0
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Ca(OH)2	0.0	10.1	89.0	89.0	1.1	78.9	0.0	1.1	1.1	0.0	0.0	1.7	1.7	0.0	0.0
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	0.0	0.7	6.0	6.0	0.1	5.3	2.0	2.1	2.1	0.0	0.0	0.1	0.1	0.0	0.0
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min subtotal solids	0.0	10.8	95.0	95.0	1.1	84.2	2.0	3.2	3.2	0.0	0.0	1.8	1.8	0.0	0.0
lb/min total	16.8	45.6	465.1	473.5	5.7	419.5	200.9	206.5	206.5	0.0	0.0	8.9	8.9	0.0	0.0
wt % moisture	100.0	76.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
wt% solids	0.0	23.7	20.4	20.1	20.1	20.1	1.0	1.5	1.5	0.0	0.0	20.1	20.1	0.0	0.0
GPM	2.0	4.7	49.0	50.0	0.6	44.3	24.0	24.6	24.6	0.0	0.0	0.9	0.9	0.0	0.0

	L11.3 Dil H2O to SDA-3	L11.4 Dil H2O to SDA-4	L12.1 Slurry Feed to SDA-1	L12.2 Slurry Feed to SDA-2	L12.3 Slurry Feed to SDA-3	L12.4 Slurry Feed to SDA-4	L13 Dil H2O to Slaker	L14 Total Contact H2O	L15 Lime Slurry to Ash cond.	S1 Peb Lime to Slaker	S2 Grit Discharge	SW1 Lime Pump Seal H2O	SW2-Excess Lime Pump Seal H2O	SW3 Dil Pump Seal H2O	SW4-Final Strainer Flush H2O
lb/min H2O	103.5	103.5	0.0	0.0	110.7	110.7	20.7	219.6	22.2	0.1	0.2	8.3	8.3	0.0	0.0
lb/min CaO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0
lb/min Ca(OH)2	0.5	0.5	0.0	0.0	2.2	2.2	0.1	0.1	6.5	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	1.1	1.1	0.0	0.0	1.2	1.2	0.2	2.2	0.4	0.9	0.5	0.0	0.0	0.0	0.0
lb/min ash	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min subtotal solids	1.6	1.6	0.0	0.0	3.4	3.4	0.3	2.3	6.9	8.5	0.5	0.0	0.0	0.0	0.0
lb/min total	105.1	105.1	0.0	0.0	114.0	114.0	21.0	221.9	29.1	8.6	0.6	8.3	8.3	0.0	0.0
wt % moisture	0.0	0.0	0.0	0.0	0.0	0.0	98.5	98.5	76.3	1.0	25.0	0.0	0.0	0.0	0.0
wt% solids	1.5	1.5	0.0	0.0	3.0	3.0	1.5	2.5	23.7	99.0	75.0	0.0	0.0	100.0	100.0
GPM	12.5	12.5	0.0	0.0	13.4	13.4	2.5	26.5	3.0	0.0	0.0	1.0	1.0	0.0	0.0

WHEELABRATOR MCKAY BAY
APC RETROFIT PROJECT

WAPC CONTRACT 3834
MARCH 26, 1999

Table 2.1.2 Dry Scrubbing System Mass Balance
100% MCR; 80%EA; Dirty Boiler; 50% UCL; SDA Off-Line

	F1 SDA Inlet	F2 SDA Inleak	F3 SDA Atom Air	F4 SDA Out	F5 FF Leak	F6 FF Out	S3 SDA Discharge	S4 FF Discharge
lb/min CO2	339.4	0.0	0.0	339.4	0.0	339.4	0.0	0.0
lb/min O2	221.6	11.9	0.0	233.5	13.6	247.1	0.0	0.0
lb/min N2	1,635.0	39.4	0.0	1,674.4	45.0	1,719.5	0.0	0.0
lb/min H2O	246.4	0.7	0.0	247.1	0.8	247.8	0.0	0.1
lb/min SO2	0.67	0.00	0.00	0.67	0.00	0.67	0.00	0.00
lb/min HCl	1.33	0.00	0.00	1.33	0.00	1.33	0.00	0.00
lb/min HF	0.04	0.00	0.00	0.04	0.00	0.04	0.00	0.00
lb/min SO3	0.05	0.00	0.00	0.05	0.00	0.05	0.00	0.00
lb/min subtotal fluegas	2,444.5	52.0	0.0	2,496.5	59.4	2,555.9	0.0	0.0
lb/min Ca(OH)2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaSO3*1/2H2O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaCl2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min CaF2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min Inerts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lb/min ash	8.8	0.0	0.0	7.0	0.0	0.0	1.8	7.0
lb/min subtotal solids	8.8	0.0	0.0	7.0	0.0	0.0	1.8	7.0
lb/min total	2453.3	52.0	0.0	2503.5	59.4	2556.0	1.8	7.0
SCFM	33,442	701	0	34,142	801	34,942	0	0
SDCFM	28,165	686	0	28,851	784	29,635	0	0
ACFM	60,651	691	0	61,319	789	63,033	0	0
vol % CO2	8.89	0.00	0.00	8.71	0.00	8.51	0.00	0.00
vol % O2	7.98	20.50	0.00	8.24	20.50	8.52	0.00	0.00
vol % N2	67.30	77.40	0.00	67.51	77.40	67.73	0.00	0.00
vol % H2O	15.78	2.10	0.00	15.49	2.10	15.19	0.00	0.00
ppm (v-wgb) SO2	120	0	0	118	0	115	0	0
ppm (v-wgb) HCl	421	0	0	412	0	403	0	0
ppm (v-wgb) HF	24	0	0	23	0	23	0	0
ppm (v-wgb) SO3	7	0	0	7	0	7	0	0
gr/scf	1.832	0.000	7000.000	1.435	0.000	0.007	0.000	0.000
gr/acf	1.010	0.000	7000.000	0.799	0.000	0.004	0.000	0.000
ppm (v-dgb) SO2 @7% O2	173	0	0	174	0	174	0	0
ppm (v-dgb) HCl @7% O2	608	0	0	608	0	608	0	0
ppm (v-dgb) HF @7% O2	34	0	0	34	0	34	0	0
ppm (v-dgb) SO3 @7% O2	10	0	0	10	0	10	0	0
gr/sdcf @7% O2	2.646	0.000	0.000	2.117	0.000	0.010	0.000	0.000
Tdb deg F	489	60	120	473	60	458	0	0
Twb deg F	148	66	0	147	20	146	20	0
Tdp deg F	130	65	0	130	19	129	19	0
Pb (in Hg)	29.65	29.90	192.73	29.44	29.90	28.85	0.00	0.00
Ps (in Wg)	-3.30	0.00	0.00	-6.15	0.00	-14.15	0.00	0.00

2.2 Spray Dryer Absorber

Flue gas enters the top of each Spray Dryer Absorber (SDA) through a diverging cone section and into the absorption section of the vessel. See Figure 2.2.1. One (1) multiple port two fluid nozzle sprays the atomized slurry down the center of the vessel, parallel to the gas glow. The flue gas and the evaporating slurry droplets pass downward toward to the hopper. The flue gas makes a 90° turn and exits the SDA. Ductwork connects the SDA outlet with the new pulse jet fabric filter (FF) inlet. Some of the flyash from the boiler and dried reaction products fall out of the flue gas and are discharged from the SDA hopper. The down flow design presents several advantages over up flow designs. In a down flow unit, the largest droplets are at a greater distance from the bottom and less likely to hit the sides as gravity affects the flow pattern. In an up flow dryer, drops can hit the walls and dried material can fall on nozzles and disrupt the inlet gas distribution devices.

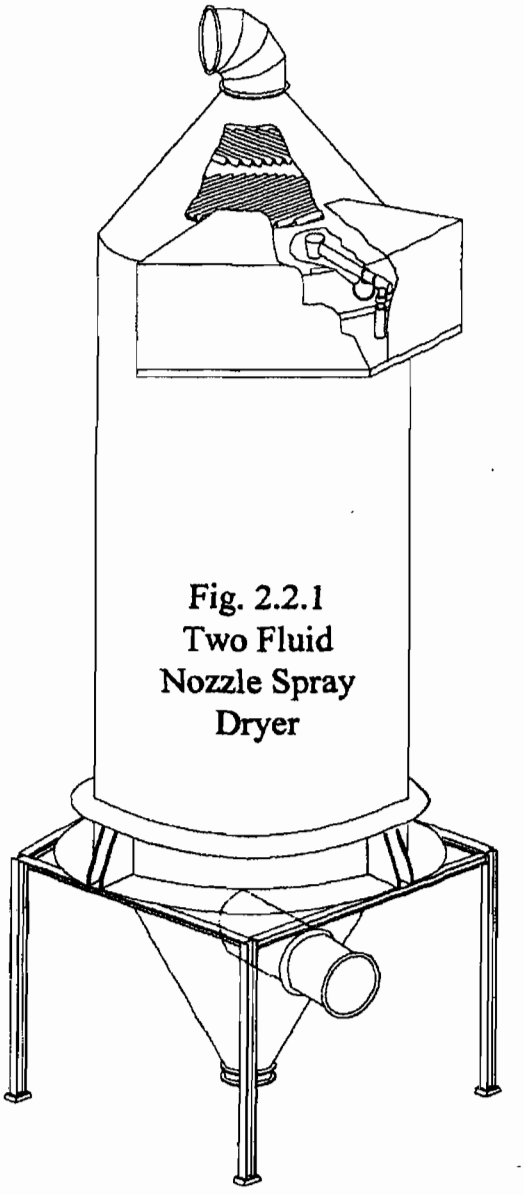


Fig. 2.2.1
Two Fluid
Nozzle Spray
Dryer

One (1) 16 ft. diameter SDA is provided for each boiler unit. The SDA is designed to provide 11 seconds flue gas residence time based on the design gas flow conditions (100% MCR).

The top cone of the SDA has two banks of chevrons. Each bank of chevrons is a series of bent plates. The plates help push the gas from the center of the vessel out to chamber walls, resulting in an even distribution of the flue gas across the spray dryer absorber cross section at the slurry injection point.

2.2.1 Atomizing Nozzles

Each SDA will be provided with one (1) operating and one (1) shelf spare nine port two-fluid nozzle. Each two-fluid nozzle consists of a stainless steel (630) head with multiple, ceramic two-fluid nozzle inserts. Each nozzle is provided with a supporting lance assembly consisting of a structural tube and an aerodynamic shroud (see Figure 2.2.2 and 2.2.3). The lance firmly positions the nozzle in the dryer. The nozzle consists of a 630 SS head with

multiple ceramic inserts. Slurry passes down the enter pipe of the head. The atomizing (compressed) air passes down the annular pipe on the outside of the slurry pipe. Ambient air is induced down the shroud through a silencer (not shown).

Slurry enters the center of the nozzle and is distributed to the back of the inserts (Figure 2.3). Atomizing air passes through the annular space and through the holes in the side of the inserts. The compressed air expands as it passes through these holes and exits the inserts. This expansion accelerates the slurry and shears it into fine droplets. Each nozzle is rated at a maximum flow of 15 gpm.

A minimum of 350 SCFM of compressed air should be supplied to each nozzle.

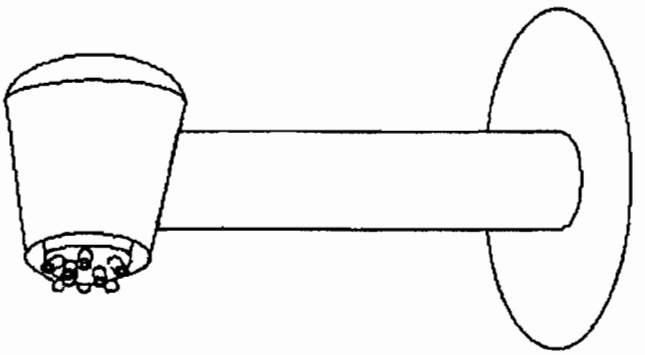


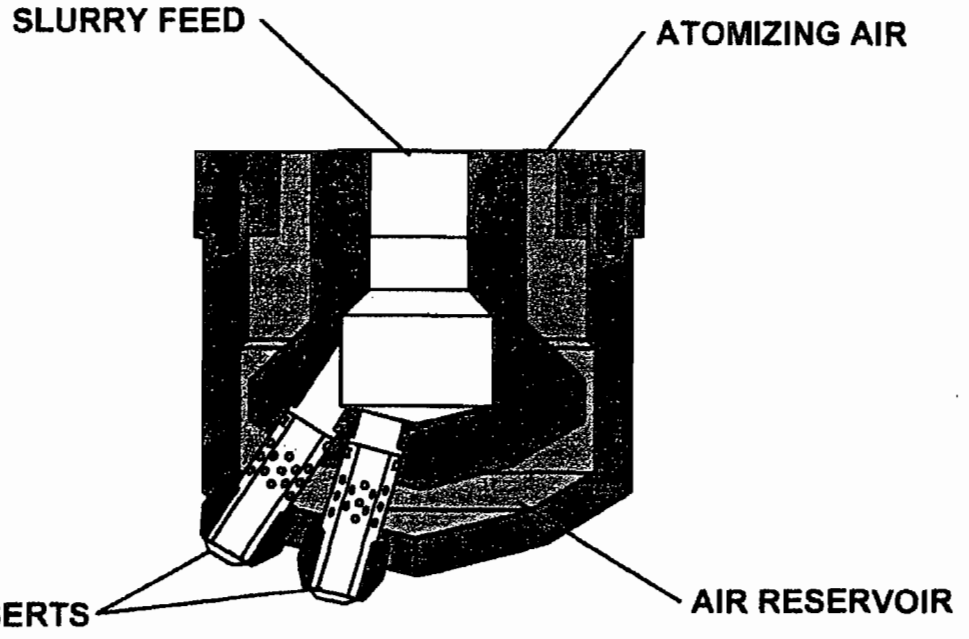
Fig 2.2.2 Multiple Ceramic Insert Single Nozzle w/ Straight Lance

There are three major areas of nozzle maintenance. The most frequent is the external buildup of lime slurry, flyash, or reaction products on the nozzle face. This buildup will grow out from the face around the spray patterns. If it is allowed to grow large enough, it will interfere with the spray pattern, causing the required fine droplets to coalesce into larger ones. This will cause drying and dust discharge problems. A nozzle inspection port is provided to inspect the nozzles the nozzles while the SDA is on-line. This buildup is soft and can be discharged by rapping the back end of the nozzle slurry and air piping with a hammer. Each nozzle should be inspected once a shift by looking in the port to observe buildup and/or poor atomization.

Each nozzle assembly (nozzle, slurry and atomizing air piping) is flanged. Hose connections are provided to connect the nozzle assemblies to the slurry and compressed air manifolds. A nozzle may be isolated, removed, and the spare assembly installed in less than fifteen minutes.

This allows quick change out of spray nozzles for maintenance.

The nozzle inserts are made of a ceramic to minimize erosion. Nozzle wear is monitored



during periodic nozzle inspections. If periodic nozzle inspections are not conducted, nozzle wear can cause a reduction in atomization efficiency. This in turn can cause damp material in the hopper catch and related ash handling problems. Although the ceramic inserts are hard and resistant to wear, they are brittle and easily cracked. Please refer to Section IV of this manual for detailed maintenance procedures for the nozzles.

The minimum orifice size in the nozzles is slightly less than 5/16 inch (7 mm). There is minimal chance of the nozzles plugging. To further minimize this, there is a rotary filter at the nozzle level to act as a final filter. A single plugged nozzle or nozzle port is not a problem in itself. A problem occurs if too many ports are plugged and too much flow is diverted to the remaining nozzles (ports). Then the air/liquid ratio decreases and poor atomization occurs. This problem can be alleviated by periodically inspecting the nozzle operation in the dryer, as described above, for external buildup.

A final feed strainer is provided to remove tramp materials from the slurry and prevent nozzle

plugging. The strainer includes a circular screen. Slurry enters the center of the screen and passed outward. A circular brush removes collected particles. These drop to a small holding chamber. The holding chamber is isolated and the collected solids blown down to a drain (SDA sump) based on a local timer. A manual basket strainer is installed in a by pass line around the automatic strainer for maintenance.

2.2.2 Hopper

The flue gas passes to the bottom of the spray dryer absorber and then up and out of the side of the vessel. The outlet duct extends into the center of the SDA. This is to maintain an even gas distribution pattern in the bottom of the SDA vessel. A shed plate is installed over the duct, to minimize dust buildup. The majority of the fly ash entering the spray dryer absorber and the solid reaction products generated by the spray dryer absorber are conveyed with the gas to the downstream particulate collection equipment. The remaining portion falls out in the spray dryer absorber hopper. This two-point discharge (flue gas and solids) provides improved operation safety over a one-point dryer discharge where all solids and flue gas exit at one point. The two-point discharge ensures an open flue gas path from the boiler through the spray dryer absorber into the fabric filter should a major dryer upset occur. The design also minimizes the carryover of any wet droplets or moist particulate that may be created by improper drying during upset conditions.

Due to the caking tendency of both the flyash and reaction products, it is recommended that the hoppers be kept as empty as possible and the ash be discharged continuously. To minimize the buildup of ash in the hoppers, the following features are provided:

- Hopper heaters are provided to keep the hopper walls warm. This minimizes the chance of material caking or sticking to the walls.

- A six (6) ft. diameter live bin bottom with an 18" discharge flange is provided on the SDA bottom to minimize rat holing. The activator is interlocked with the ash removal system.

- Air impactor hammers are provided to vibrate walls. These are manually initiated at a panel located at the hopper level for a preset time period and then automatically shut down. The impactors should only be used for upset conditions. Overuse may damage the hoppers.

2.2.3 Access/Nozzle Enclosure

A nozzle enclosure is provided for nozzle and slurry feed control valve maintenance. The enclosure includes a checkered plate floor, drains, ventilation fans, and air intake louvers. There are cross walls between the enclosures. These also serve as pipe bridges.

2.2.4 Spray Dryer Absorber Process Control

The main control loops for the spray dryer absorber are total slurry feed control, which is designed to maintain the SDA outlet temperature (285 °F recommended) and the control of the mixture of concentrated lime slurry and dilution water, to maintain the required SO_2 emission limits (see WAPC Drawing 04-21-3-110). Experience has shown that HCl is absorbed much more readily than SO_2.

Temperature control is considered primary. The SO_2 compliance requirement is averaged over a larger period. SO_2 removal and heavy metal removal are very temperature dependent. The filter cake built up in the Fabric Filter also provides residual SO_2 and HCl control, without slurry feed to the SDA. Instability in temperature control can cause an upset in the SO_2 control loop.

Lime slurry and dilution water are pumped to each SDA. A lime slurry shutoff valve is provided for each SDA (FV-1550). (See drawing No. 04-21-3-110). The lime slurry and dilution water are mixed upstream prior to the SDA Total Feed Control Valve (FCV-1630). This valve is modulated to maintain the flue gas outlet temperature setpoint from the SDA.

Spray dryer inlet, outlet and hopper flue gas temperature will be monitored and recorded at the operator's control console of the DCS. Low outlet temperature (TAL(TIC-1050)) (see Drawing 04-21-3-310) indicates too much slurry is being added to the SDA. This results in damp material in the SD/A hopper catch and related ash handling problems. Alarms are provided for a low and a low-low outlet temperature condition. A low-low condition results in slurry feed shutdown.

The ratio of lime slurry to dilution water is controlled by the SO_2 concentration entering and leaving the system. The spray dryer outlet temperature is monitored by two thermocouples located in the spray dryer outlet ductwork (TE-1050 A&B). Two thermocouples are provided for redundancy. The operator selects which measurement is used for control (HS-1050, Drawing 04-21-3-310). Both measurements are continuously indicated. The selected temperature signal is fed to the spray/dryer outlet temperature controller (TIC-1050), which is used to control the total amount of lime slurry / water mixture entering the SD/A. The output signal from the SDA outlet temperature controller (TIC-1050) is cascaded as a setpoint to the total flow controller (FIC-1551), which adjusts the total flow control valve (FCV-1551) based on a signal from the total flow meter (FIT-1551).

The spray dryer outlet temperature is compared to the spray dryer flue gas temperature measured within the hopper of the SDA (TIT-1100). Operational experiences have shown that if the temperature in the spray dryer hopper is more than 8°F lower than the outlet flue gas temperature, an operation problem is occurring and can typically be traced to poor atomization an/or nozzle problems. An alarm (TDAH-1075) will annunciate this condition and alert the operators to investigate causes and fix the problem.

The concentration of SO_2 will be measured at the inlet of the SDA (AE-1010) (Drawing 04-

21-3-110) and at the outlet of the FF (AE-1071) by the Continuous Emission Monitoring System. Results will be reported as parts per million on a dry gas basis at 7% Oxygen (ppm(v-dgb) @ 7% O_2). This is to (a) meet emission reporting requirements, and (b) provide a signal that is adjusted for the water added in the SDA and inleakage of ambient air that occurs across the SDA/FF. The distributed control system (DCS) will calculate the least stringent outlet emission rate necessary to meet the 80% SO_2 removal requirement (AT-1071A, Drawing 04-21-3-311) or 29 ppm(d) @ 7% O_2 requirement (AT-1071A). The

DCS will then adjust the ratio of concentrated slurry and dilution water feed to the SD/A to meet the requirement.

The output from the two SO_2 controllers is comparable to the percent dilution water required to maintain SO_2 control. This percent is multiplied by the measured total flow rate to determine the dilution water flow rate. This rate is cascaded as a setpoint to the dilution water flow controller (AIC-1020) which modulates the dilution water flow control valve (FCV-1630) (Drawing - 04-21-3-310) based on a signal from the dilution water flow meter (FY-1630). Dilution water is always controlled at some level below total flow. Lime slurry flow makes up the difference between total and dilution water flow.

A hand control station (HIC-1630) is provided to override the SO_2 controllers during startup or if needed during periods of SO_2 analysis maintenance. This hand controller also includes high and low limits. The low limit is to prevent feeding 100% slurry that has shown to cause nozzle plugging. The high limit is to always assure there is a minimum amount of lime entering the SDA. This is to provide a solid surface to promote drying. There would also be conditions of low SO_2/high HCl concentrations leaving the boiler. This could result, using only SO_2 control in too little lime to control the HCl and a SDA product with high concentrations of calcium chloride ($CaCl_2$). $CaCl_2$ is hydroscopic and tends to cake and stick. Providing a minimum lime feed is beneficial for ash handling.

2.3 Absorbent Preparation System

The purpose of the Absorbent Preparation System is to prepare a concentrated lime slurry and dilution water; and pump both streams to the SDA's. The equipment consists of:

- two pebble lime storage silo/accessories
- redundant lime slakers and grit screens
- redundant lime slurry storage tanks
- dilution water tank and grit screen
- redundant lime slurry pump set
- redundant dilution water pumps
- redundant seal water pumps

2.3.1 Process Considerations

a) Slaking System

The primary purpose of the Absorbent Preparation System is to provide a reactive, lime slurry to the SDAs. The slurry consists of very fine calcium hydroxide ($Ca(OH)_2$) particles suspended in water. The finer the particle, the more SO_2/HCl it will absorb from the flue gas in the SDA.

Pebble lime (sometimes called quick lime) will be supplied in self-unloading trucks and pneumatically conveyed into the storage silo(s). Pebble lime is mostly calcium oxide (approx. 90% by weight). The pebble lime particle size is based on delivery sources will range from granular (<1/8 in.) to pebble size (3/4 in.). Chemically speaking, pebble or quick lime is essentially calcium oxide (CaO). Calcium Oxide is made by heating limestone (calcium carbonate ($CaCO_3$)) to drive off carbon dioxide molecules from the limestone.

Redundant "paste type" slakers are provided to mix the pebble lime (CaO) with water and produce lime slurry $Ca(OH)_2$. Chemically, the reaction proceeds as:

$$CaO + H_2O \rightarrow Ca(OH)_2$$

There are three process considerations of which to be aware of when "slaking" lime: (1) the above chemical reaction is "exothermic" which means it releases large amounts of heat. (2) The reaction rate is temperature dependent. The warmer the lime/water mixture is, the faster the reaction progresses, which gives off additional heat. This causes the lime slurry to get hotter, and then gets faster. . . etc. (3) A slurry that is slaked very hot produces a much finer $Ca(OH)_2$ particle, and a much more reactive slurry. A slurry that is slaked cold, (<170°F) is not as reactive and presents handling problems. Therefore, the lime slakers will also operate very hot (170-212°F). Use caution when working around the slaker, grit screen, slurry tank and pumps.

NOTE: The most important consideration during the lime slaking process is Safety. Please read the special safety section in this manual relating to the lime system.

The most important consideration during the lime slaking process is Safety. Lime dust (CaO) will react with the moisture on your skin, in you eyes, and in your lungs. It will react with this moisture and create heat causing severe chemical burns. Proper safety equipment must be worn whenever doing maintenance on the silo and lime feeder that meters dry lime into the slaker.

The "paste type" slaker takes advantage of these factors. The paste slaker is a two chamber reactor (See Figure 2.3). The first chamber is similar to a pug mill that mixes the pebble lime and water to make a paste (approximately 40 wt%). The paste

then is diluted to the design concentration 20 wt% downstream of the paste section. This allows the paste to reach a higher temperature much faster than if a 20 wt% slurry is made in one step because there is less water to heat up.

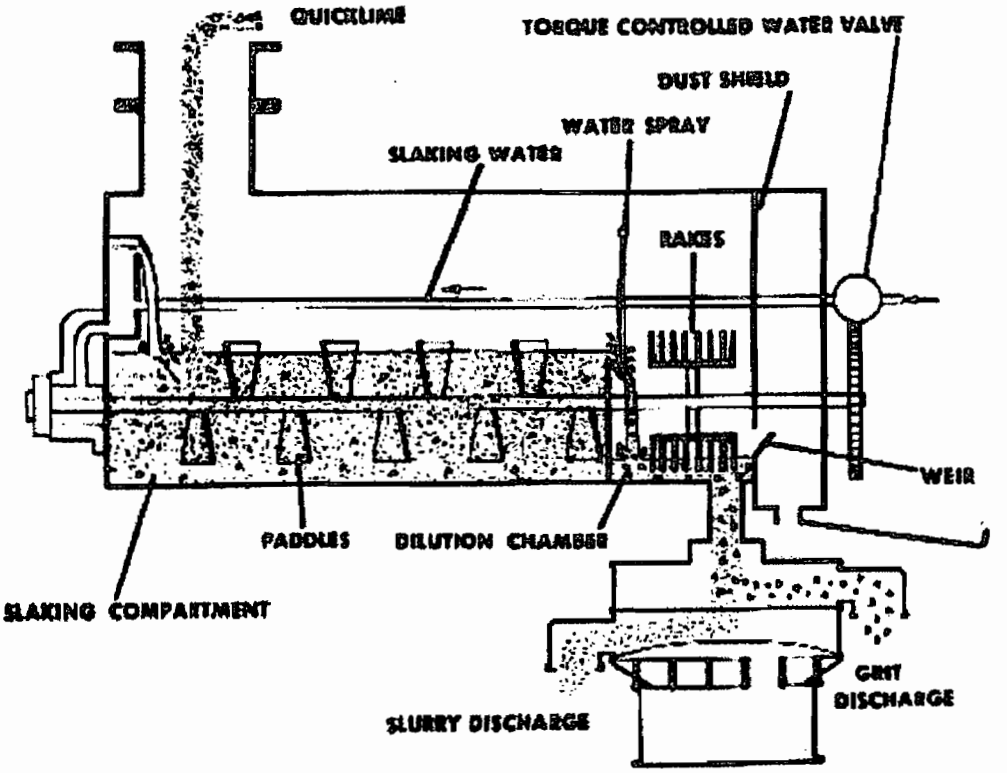


Figure 2.3 Paste Slaker

(b) Dilution Water System

Various sources of water, including plant wastewater, will be used for slurry dilution. The water is considered "hard". Chemically speaking, this means it has a high concentration of liquid phase carbonate (CO_3) and sulfite/sulfate (SO_3/SO_4). When hard water is mixed with lime slurry, a calcium carbonate ($CaCO_3$) or and/or Calcium Sulfite/Sulfate scale is formed. This would create a severe problem if the hard dilution water was mixed with the lime slurry in the piping immediately upstream of the nozzles. The scale would quickly plug the piping. To slow this type of reaction, a small amount of lime slurry is added in the dilution water tank. This allows many of the scaling reactions to take place within the tank where it is much less of a problem.

2.3.2 Silo

The two lime silos are sized to provide a total of either ten (10) days storage at the MCR Flow/Nominal SO_2/HCl concentration conditions or design (90% UCl) boiler outlet SO_2/HCl

concentration or 10 days storage (240 hrs) at the average SO_2/HCl concentration with the three boilers operating. Lime will be conveyed from self-loading pneumatic trucks into the silo(s). A limit switch, connected to the fill tube connection, will activate a bin vent filter, located on the silo roof.

High and Low Level alarms are provided for each silo. The high level indicates a full silo and is used to alarm the truck driver not to overfill the silo. The low level indicates that very soon there will be insufficient lime to operate. Level indication is provided on the DCS panel using a sonic type level instrument.

Pebble lime is discharged from each silo using a live bottom through a automatic slide gate type valve to a dedicated slaker. The slide gates are provided for maintenance of the slaker, if required. (See drawing 04-21-3-120.)

2.3.3 Slaking System

Lime is fed from the silo to the slaker using a volumetric screw feeder. The slakers are designed to produce a 22 wt% $Ca(OH)_2$ slurry (approximately).

Each of the two redundant slaking systems consists of a volumetric feeder, paste slaker, and grit screen. The volumetric feeder is set at a fixed rate based on the slaker capacity and expected lime consumption. Lime falls into the slaker "paste chamber". Water is mixed with the pebble lime using two horizontal paddle agitators. Lime paste overflows a weir at the end of the first chamber and falls into the dilution chamber. An electronic torque valve controls water fed to the first chamber. Electric current to the agitator motor is monitored. Water feed is modulated to maintain a set torque that relates to paste consistency. Water is introduced to the dilution chamber using "cut off" sprays. The spray directs the water to the overflow weir from the paste chamber. This water flow is set manually. The paste chamber agitator blades extend through the dilution chamber. Rakes installed on the shafts mix the paste with the dilution water. The diluted slurry overflows the slaker to the grit screen.

The cut off spray flow rate, as mentioned above, is manually set during start-up. Operation below a critical point will produce too weak of a spray that will not cut the paste as it passes over the weir. This can result in paste plugging the drain line from the slaker to the grit screen. This critical point is close to the maximum flow capacity of the nozzles.

This requires that the slakers be operated over a narrow lime feed rate range. The slakers will be set up to run at approximately 1,200 lbs/hr of pebble lime. Operation above this point will cause too thick a slurry to be made since the dilution spray is set at a fixed flow rate. Operation too far below the set point will cause too thin a slurry to be produced. If the slakers are to operate at a different flow rate, the cut off spray nozzle tips should be changed to match the revised flow rate.

The grit screen is used to remove inert materials and unslaked lime. Slurry flows from each slaker onto a dedicated oscillating grit screen. The oscillating motion causes the collected grits to vibrate toward the discharge chute. The collected grits fall to a grit box at grade. A spray is provided to wash lime from the grit particles. Both grit screens are located above their dedicated lime slurry tank.

The material collected on the grit screen and box should be "clean" sand and gravel particles with a few hard white flakes of hard burned or unreacted quick lime. If there is excessive flakes, it means that the lime slaked was hard burned. If there is excessive white sticky gel, it means that the slaker is not operating properly.

The grit screen has 20 mesh openings. Trace carbon dioxide (CO_2) in the air will react with the lime slurry and cause scale to form on the screen. This will, over several weeks, cause the screen to blind. To remedy this, the screen element is removed and a spare installed. The dirty screen is then soaked in acid to remove the scale. Please refer to the Vendor Slaker Manual.

2.3.4 Slurry Tanks, Pumps, Recirculation Loop

Lime slurry overflows each slaker grit screen into a dedicated agitated slurry tank. The slurry tanks provide eight (8) hours storage at the design lime consumption rate. Redundant slurry pump sets are provided to pump slurry from the slurry storage tank to the spray dryers and back to the storage tank. Each slurry pump set consists of two slurry pumps in series to produce the necessary head, while maintaining suitable impeller tip speeds. Each slurry pump has a hardened alloy impeller (27% chrome) and a casing liner. The slurry is pumped through single slurry recirculation loop to both SDAs (phase I) and shall flow to all four SDA's upon completion of phase II.

Each pump is provided with a water-flushed packing gland seal. High pressure water is produced by the seal water pumps and is delivered to the packing gland and flows into the slurry feed pumps. Operation without seal water will cause slurry to flow from the pump through the seals and damage the pump shaft and seals and causing messy conditions on the floor. Adequate seal water pressure is a permissive to start the pumps. During operation, low seal water pressure will alarm and stop the pumps.

The lime slurry recirculation loop is utilized to maintain proper flow and pressure to all operating SDA's. Lime slurry consists of suspended particles (approx. 22%) in water. If flow is stopped for an extended time, the particles will settle out, unless the loop is properly flushed and drained. The lime recirculation loop is equipped with automatic flush valves that will open upon pump shutdowns. The recirculation line is flushed back into the slurry storage tank(s) to prevent lime fallout in the pipeline.

2.3.5 Slurry Tank/Recirculation Loop Control

Lime slurry flow in the recirculation loops is controlled to maintain a constant flow leaving the slurry pumps. Slurry flow is measured by a magnetic flow meter (FIT-0520, Drawing 04-21-3-121) and indicated on the DCS. The measured flow is then used to modulate a double pinch valve in the return line to the slurry tank (FCV-0520, Drawing 04-21-3-122). The two (2) valves in series are provided to minimize pressure loss across an individual valve that reduces wear. The valves are a hydraulic type design that compresses around the full circumference. This minimizes wear compared to a mechanical actuator that pinches only from two (2) sides. The two-side pinch produces an internal ridge that erodes faster.

2.3.6 Lime and Water Quality

To produce a reactive lime slurry, a highly reactive pebble or quick lime should be purchased. WAPC recommends that the pebble lime should meet the following requirements:

Size	< 3/4"

CAO Content	minimum 85%
Reactivity per ASTM	< 110-7
Slaking Temperature Rise	4^0 C / minute
Maximum Reaction Time	10 minutes

Lower CAO content than specified will effectively lower the capacity rating of the slakers. If a low reactivity lime is supplied, it may not react or slake fully within slaker. This situation will cause the grit screen to plug. Low lime reactivity is a function of the original limestone and how that particular limestone was calcined to make the lime. The lime can be "hard burned". This sinters or produces a hard glassy surface on the lime particles. This slows down the slaking reaction.

Lime samples should be taken periodically and analyzed to assure you are receiving the lime you pay for. It is a good practice to take a sample from every delivery, even if you do not analyze it. The truck driver will see it, and tell the plant, and then you will be less likely to get a bad batch.

This slaking system and lime feeder has been designed to use "pebble lime", or 1/2 or 3/4" particles. Lime is sometimes supplied in granular or powdered form. The slaker will slake granular or powdered lime; however, the lime feeder may flood. This can result in powdered lime flowing through the feeder and out the top of the slaker feed chute creating a severe safety hazard. It is possible to lose a whole silo of lime during these situations.

The "pebble type" design feeder auger has large clearances to prevent binding. The feeder auger may be changed to handle granular or powdered lime, however it must be done prior to receiving this type of lime. The powder design feeder auger or screw, however, will not work with pebble lime.

The primary requirement for water feed to the "paste" chamber is that it contains less than 500 mg/l of total dissolved sulfate, sulfite and bisulfite. These components react with the lime particle or pebble. This prevents the water from reacting with the calcium oxide behind the scale.

2.3.7 Dilution Water

Various sources of water, mainly plant wastewater, is used for slurry dilution. The wastewater is fed to a dilution water tank that holds approximately 2 hours usage (12,000 gal). An oscillating grit screen is provided to filter tramp materials prior to the tank.

Lime slurry is added to the dilution tank to minimize precipitation within the pipelines. This precipitates dissolved carbonates and metals within the wastewater tank, not in the water pipes. If the lime were not added in the tank, the precipitation would occur in the

piping, just upstream of the nozzles, where the dilution water is added to the concentrated lime slurry. The precipitated carbonates would very quickly scale the piping, and restrict the flow.

Two (2) 100% plant capacity pumps are provided to pump water from the dilution water tank to the four SDAs. See Drawing 04-21-3-122. The pumps are arranged in parallel. Both pumps are equipped with manual inlet and outlet isolation valves. A recirculation valve circulates water back to the dilution water tank to maintain a constant flow from the pumps (FCV and FY-0620). This protects the pump from overheating when water demand is low (i.e. one or two SDAs off line).

Water is continuously added to the tank to maintain a preset level. This is accomplished by using a continuous sonic level transmitter (LIT-0600), controller (LIC-0600), and level control valve (LCV-0600). The water flow rate is controlled by tank level. The flow into the tank is monitored (FE-0660).

The pH of the water in the dilution water tank should be monitored periodically. The target pH value is between 11.5 and 12.0. Operating at lower pH values will result in excessive pipe scaling at the nozzle level as solid precipitation will not occur within the tank. Operation above 12.0 pH is also not desirable as scaling potential will not improve much. Higher pH values indicate that too much lime is being added to the tank adding excessive solids to the water system. This will result in premature wear of the dilution water pumps.

2.4 Activated Carbon Injection System

Two Powdered Activated Carbon (PAC) Injection Systems (one for each pair of boilers) are provided to enhance both Mercury and Dioxin/Furan Control. Each system consists of storage silo and three feeder/educator systems (two operating/one spare) to pneumatically feed a controlled amount of PAC into the inlet ductwork of each SDA. The amount of activated carbon feed into the system is manually adjusted. Flow rates will range from 2-25 lbs/hr per boiler. The feeder speed is monitored and recorded by the Continuous Emission Monitor. The initial setpoint is 5 lbs/hr. This will be optimized during start-up.

PAC will be stored in two (2) activated carbon storage silos. One silo is dedicated to one set of boilers. Powdered carbon will be loaded into the silo from pneumatic discharge bulk trucks. Each silo is sized to hold approximately 70,000 lbs of PAC. Each silo will have a multi-pleated bag filter to clean the conveying air from dust.

PAC is discharged through three points in the bottom of the inverted cone hopper. The hopper is fluidized with compressed air to maintain flow. Each discharge point includes a manual slide gate isolation valve. A rotating feeder is used to meter the PAC to a surge hopper/feed chute that supplies PAC to a screw feeder. The screw feeder meters PAC to

the inlet throat of a venturi educator. A positive displacement blower also feeds air to the back of the venturi. The high air velocity in the venturi throat creates a negative pressure, and sucks in additional air and the PAC. The air expands downstream of the venturi into the piping. Three (3) pipe lines are provided to convey PAC to the SDA inlet ductwork. Flexible hose connections are provided to connect any of the four feeder/eductors to the three conveying lines.

PAC feed from the silo is based on level control in the feed hoppers. See Drawing 04-21-3-128. Upon reaching a low level in one of the hoppers (LSL-0711A) the hopper fluidizing system and rotary valve are started (M-0704A). Feed is stopped when the high level LSH-0710A is reached.

A high and low pressure switches are provided for each conveying line. The high pressure switch indicates a plug and shuts down the feeder in addition to providing an alarm. The low pressure switch (PSH-0723A) alarm indicates a blower or pipeline failure.

Please refer to the Powdered Activated Carbon Injection Manual for more detailed information.

Safety Consideration

Powdered Activated Carbon is very fluid. Proper care must be taken to assure that the silo feed is closed off when doing maintenance on any equipment. Even a small leak can cause the entire content of the silo to empty into the very small equipment enclosure.

It is recommended that the entire feed hopper be emptied before doing any maintenance. This is accomplished by running the feeder and blower in manual with the manual silo knife gate closed.

Pneumatic conveying of PAC also creates static electricity. All equipment should be grounded.

2.5 Fabric Filter

Each boiler is supplied with a WAPC six (6) module, Size 1211 TA-SB, Model 192 Series 6P Jet III Fabric Filter Pulse-Jet Dust Collector. Each module contains 12 rows of 11 glass fiber bags supported on wire cages.

This system is designed to filter 52,800 acfm of 285°F flyash and hydrated lime dust laden air with a gross air-to-cloth ratio of 2.65:1 (all modules on-line); and a net ratio of 3.18:1 (one (1) module off line); and a net/net ratio of 3.98:1 (two (2) modules off line).

The filter bags for these units are constructed of woven fiber glass with PTFE membrane and acid resistant finish.

These filter bags have the following physical characteristics:

Maximum allowable operating temperature:	525°F
Weight finished	16 oz/sq.yd.
Filter bag diameter	6"
Filter bag length	192"

Modules are 1/4" ASTM A-36, welded, stiffened to withstand ±25" W.G. at 525°F. Hoppers have a minimum valley angle of 60°. Hopper auxiliaries consist of the following:

- 10" x 10" flanged discharge opening
- two (2) 6" x 6" striking anvils
- one (1) 24" diameter hinged access door c/w Viton Seals
- one (1) 20" x 48" hinged plenum access door (oval design)
- one (1) 12" diameter rod out door
- channel frame

One (1) inlet damper is provided for each module. Each damper is a 18" x 36" butterfly type with chain wheel-operated manual actuator. The inlet damper is closed only when a compartment must be isolated for personnel entry when other compartments remain on line.

One (1) outlet damper is provided for each module. Each damper is a 30" diameter poppet type assembly which includes air cylinder, manual lockout, 4-way solenoid valve, air speed control valves, and two (2) limit switches. Outlet dampers must be closed for off-line bag cleaning and isolation for personnel entry when other modules remain on line.

2.5.1 Fabric Filter Bags

The Jet III Pulse Jet Fabric Filter Collector is a continuous automatic dust collector capable of filtering dust-laden air through a felted filter media.

The dirty or contaminated gas enters the dust collector through the module inlet. A baffle plate distributes the gas uniformly throughout the housing and drops out the heavy particulate into the hopper. The dust laden air then passes through a number of filter bags which retain the dust particles on the exterior surface while allowing the gas to pass through the module outlet.

As the fabric filter collector operates, the collected dust begins to form a dust cake that eventually diminishes the porosity of the filter bags. This reduction in porosity is measured as pressure loss by the pressure gauges located at each module.

To maintain stable pressure drop a cleaning cycle is employed to provide continuous cleaning of the filter bags. The cleaning system consists of a solid state timer located at each module that actuates electric solenoids governing the air valves. These air valves deliver a momentary burst of pulse of high-pressure compressed air through the manifold pipe into the filter bag. This pulse of air creates a reverse airflow that expands the filter bags to remove the collected dust.

The dust cake, when removed from the filter bag, falls directly into the hopper where it is removed by the dust conveying system.

There is a combination of six (6) possible cleaning formats on the fabric filter collector. The operating mode of the fabric filter collector can be selected to clean either online or offline. Either of the previous states is to be selected and used with one of three (3) cleaning modes. The cleaning modes that control the cleaning operation of the fabric filter collector are: pressure drop (delta-p), time, and manual. The operator may select any one of these three modes depending on the cleaning needs of the fabric filter collector.

It is recommended that the fabric filter collector be cleaned in the online operating mode and the delta-p cleaning mode.

<u>On/off line operating modes</u>

The fabric filter collector will utilize two (2) operating modes of cleaning: online and offline. Online cleaning is done when all of the inlet and outlet dampers of non-isolated modules are open. This will allow all of the modules to be actively filtering while they are cleaning. When using this method of cleaning, the fabric filter collector will clean a predetermined number of filter bags in one module, and then step to the next module in the cleaning sequence. There is a memory built into the cleaning system to ensure that all filter bags are cleaned only once during a cleaning cycle.

The second operating mode of cleaning available is offline cleaning. When a module is cleaned offline, the outlet damper of that module will be closed. With the outlet damper closed, the module is considered to be offline. This operating mode will allow the cleaning of the fabric filter collector one module at a time.

2.5.2 Cleaning Sequence and Pulse Jet Mechanism

The cleaning of the fabric filter system relies on one of three (3) cleaning modes at anytime during the operation. The three modes (manual, time and delta-p) are described below.

2.5.2.1 Manual Cleaning Mode

The manual cleaning mode is primarily to be used as a troubleshooting and maintenance tool. This mode of cleaning will clean one module, on demand, and stop all other automatic cleaning sequences completely. To restart the automatic cleaning, the operator must reset the delta-p or time cleaning mode. The cleaning is done by the operator and is a totally manual procedure. While in manual cleaning, the operator may select any module to be cleaned. The operator action required to initiate this mode of cleaning is as follows:

1) select manual cleaning mode.

2) select a module to clean. Once the manual mode has been selected the operator may select a module to be cleaned.

3) select offline cleaning. When offline cleaning has been selected the operator must manually close the module outlet damper before the module is cleaned.

4) start the cleaning cycle. To start the cleaning of the fabric filter, the operator is required to press a start key. When offline cleaning has been selected and the cleaning is complete, the operator must open the module outlet damper.

The operator is to make sure that the system is returned to the delta-p or time mode when finished in the manual cleaning mode.

2.5.2.2 Time Mode

The second mode of cleaning is the time mode. The time mode will clean the fabric filter regardless of the system operating conditions. Cleaning will continue on a strict time basis until the operator changes the cleaning mode.

The operator action required to initiate this mode of cleaning is as follows:

1) select online or offline cleaning. The selection of the online or offline mode is to be done as was described earlier.

2) select the time cleaning mode. Cleaning will start.

2.5.2.3 Delta-p Mode

The final mode of cleaning the fabric filter is by use of the delta-p mode. When in this mode, the baghouse will clean only when the system differential pressure exceeds the preset value. The differential pressure is measured from the inlet of the fabric filter collector to the outlet of the collector using a differential pressure-indicating transmitter. When a high differential pressure is recognized, the system will clean until the pressure has decreased to an acceptable value. After this has happened, the cleaning cycle will finish cleaning the module selected and then stop its cycle. When the differential pressure again increases to the setpoint, the cleaning cycle will begin again starting with the module following the last one cleaned.

The operator action required to initiate the mode of cleaning is as follows:

1) select online or offline cleaning. The selection of the online or offline cleaning mode is to be done as was described earlier.

2) select the delta-p cleaning mode.

2.5.2.4 Baghouse Cleaning Timer Adjustment

There are a number of timers needed in order to give the cleaning cycle the versatility needed. The following is a list of timers that will be needed.

1.) damper close time – this timer will allow the outlet damper the correct amount of time needed in order to close. This timer will only be needed in offline method of cleaning.

2.) Module clean time – this timer will set the amount of time that the Jet III timer boards are to be energized. There will be two timers available to perform this function. There will be one timer for online cleaning and another for offline cleaning. Because of the differences in cleaning methods it may be necessary to clean the modules for different periods of time. The online timer is set to sequential pulse 2-3 rows of bags. The offline timer is set to clean all the bags in a module.

3.) settle time - this timer will allow for the dust to settle in the hopper after being cleaned and before the module is brought back into service. If the dust has not settled into the hopper, when the module returns online the dust may be re-entrained onto the filter bags. This timer is for offline cleaning only.

4.) interval time - this timer will allow the outlet damper to be opened after the module has been cleaned, using the offline mode of cleaning. When using the online mode of cleaning, this timer will act as a transition timer that allows the fabric filter flow to stabilize before cleaning another module whether it be in the online or offline mode.

2.5.2.5 Cleaning Cycle Timer Sequences

The following table indicates the cleaning options and their required timer sequences for the two cleaning methods, online and offline. The cleaning cycle must be programmed using the same sequence of operations as is listed below.

	online	offline
time:	clean time interval time	outlet damper close time clean time settle time interval time
delta-p:	clean time interval time	outlet damper close time clean time settle time interval time
manual:	clean time interval time	outlet damper close time clean time settle time interval time

2.5.2.6 Individual module isolation

The information presented here is to familiarize the fabric filter operators with the recommended procedure for isolating one (1) module from gas flow for personnel entry while the others modules remain on-line filtering.
The following safety rules are recommended for personnel entering an isolated module:

1) Always carry and/or know where the closest communication device is located.

2) Any person entering an isolated compartment should be properly attired in coveralls, hard hat, hard soled work shoes and gloves. Also, some form of protective breathing device and eye protection should be used.

3) Remove rings, watches, metal frame glasses, etc. Metallic items may be heated by radiation from compartment interior surfaces.

4) Never enter an isolated module without having another person standing outside the module door.

2.5.2.7 Module Isolation

Place the selected module isolation switch to the "isolate" position. Tag or lockout switch. The isolation switch is located adjacent to the tubesheet access door. When the isolation switch is turned off, the outlet damper should close, which should be visually verified by the operator. Additionally, the isolation switch locks out the module pulse valves from the control panel so that a module may not be cleaned manually or automatically while it is isolated.

Close the module inlet damper and tag out. The inlet damper is hand operated by pull chain. A padlock placed through the chain links will prevent anyone from opening the inlet damper.

Open the module access door. Allow cool down time before entering the module.

2.5.2.8 Placing module back on-line

After inspection and/or maintenance is complete, the module should be placed back into operation by following this procedure.

- verify that all personnel are out of the compartment.
- close and seal the access door.
- make sure that the hopper door is also closed and sealed.
- remove tag and/or unlock the isolation switch.
- place the isolation switch into "in-service" (outlet damper should open).
- remove tag and/or unlock inlet damper.
- open inlet damper via pull chain.

2.5.2.9 Fabric Filter Protective Interlocks

The following is a summary of abnormal fabric filter operating conditions and the automatic interlocking action that will take place for each. The fabric filter high-high differential pressure will be alarmed at 10" w.c.

The fabric filter low-low inlet temperature will be alarmed at 250°F and a signal is then sent to shutdown the SDA.

The SDA outlet/fabric filter high inlet temperature will be alarmed at 325°F (from TIC-1050).

The fabric filter high-high inlet temperature (TSHH-1050) will be alarmed at 500°F and a signal sent to trip the primary air fan.

2.5.3 Hopper impactor control

Two (2) impactors are provided on each fabric filter compartment hopper to assist in ash removal. Each pair of impactors constitutes a system inasmuch as it is operated in a timed and interlocked sequence.

The hopper impactor system is initiated for a pre-determined time period after one hour of filter operation or when a compartment cleaning cycle is complete. Each time the hopper double dust valve is opened the first impactor (single impact) energizes. After a 5 second delay the second impactor (single impact) energizes. This sequence will continue until the pre-determined time period is complete and the next cleaning cycle is initiated.

Both the impactor "on-time" and maximum interval (one-hour) time can be changed if required to accommodate actual field conditions.

2.5.4 Safety Considerations

- keep alert at all times!
- follow all plant safety regulations concerning protective clothing, eye, ear, and head protection. Always wear your hard hat. Wear safety glasses when working in the absorbent preparation area and when working on the sd/a nozzles on slurry piping. Wear ear protection in the sd/a penthouse.
- follow all caution signs posted throughout the installation. Remember the process uses lime, a caustic chemical.
- study the lockout procedures carefully. Remember the equipment is used to process flue gas which is not safe to breath. Make sure the section you are entering has been ventilated before entering. Only enter the SD/A when the boiler is off. Open the penthouse access door before entering the SD/A hopper. Allow the FF compartments to ventilate for 15 minutes - 1 hour before entering. Wear a dust mask when entering any hopper.

- always make sure a hopper is empty or ash level is below the door level before opening a hopper. Do this by opening a higher level door, or removing a bag from the fabric filter tube sheet. Drowning in hot ash is a terrible way to die.

If there are any questions, contact your supervisor or plant safety personnel. Your safety is your responsibility.

3.0 SNCR NOx Control System

3.1 Process Description

The **NOxOUT©** Process is a post-combustion NOx reduction method that reduces NOx through a controlled injection of an aqueous solution containing **NOxOUT A** or other **NOxOUT©** reagent into the combustion gas path of fossil-fired boilers, furnaces, incinerators or heaters. The reagent is a 50% urea solution plus a small amount of additives for scale and corrosion control. This reagent is readily available and requires no special safety precautions for handling.

The use of urea for control of oxides of nitrogen was developed under the sponsorship of the Electric Power Research Institute (EPRI) between 1976 and 1981. These investigations provided fundamental thermodynamic and kinetic information of the NOx-urea reaction chemistry and identified some traces of by-products. Though some trace quantities of ammonia and carbon monoxide may form, the quantities of these can often be controlled through application know-how. The predominant reaction is described as:

$$CO(NH_2)_2 + 2NO + 1/2\ O_2 \rightarrow 6\ 2N_2 + CO_2 + 2H_2O$$

Urea + 2 Nitrogen Oxide + ½Oxygen → 6 Nitrogen + Carbon Dioxide + 2 Water

The NOx removal efficiency and reagent utilization are related by a variable known as Normalized Stoichiometric Ratio (NSR). This ratio is defined as shown below. Reagent utilization is equal to the NOx reduction divided by NSR.

$$NSR = \frac{\text{Actual Molar Ratio of Reagent to Inlet NOx}}{\text{Stoichiometric Molar Ratio of Reagent to Inlet NOx}}$$

The technology has expanded by developing chemical injection hardware, widening the applicable temperature range, and process control expertise required for commercial applications. The technology's licensing agreement with EPRI, combined with successful in-house developments, is marketed commercially under the trade name **NOxOUT©.**

Two key parameters that affect the process performance are flue gas temperature and the reagent distribution. The NOx reducing reaction is temperature sensitive; by-product emissions become significant at lower than the optimum temperature range while chemical utilization and NOx reduction decrease at higher than the optimum temperature range. This optimum range is specific to each application. The reagent needs to be evenly and appropriately distributed within this optimum temperature zone to obtain the best performance.

Chemical injectors developed specifically for the process facilitate the reagent distribution. Utilizing pressurized air, these injectors atomize and direct the reagents into the combustion gas path. The droplet size distribution and spray coverage developed by the injectors promote efficient contact between the reagent and NOx in the flue gas.

The process provides effective boiler load following capabilities. Through the computer modeling, an injection strategy can be developed that makes use of multilevel injection, control of reagent concentration, and droplet size and spray patterns.

Several years of field-testing indicate that the **NOxOUT©** Process is applicable on various types of units firing many different fuels. The process was successfully proven on units fired with coal, oil, gas, wood, or municipal solid or hazardous waste. These units varied in size and type: package boilers, process heaters, incinerators, circulating or bubbling fluidized beds, waste heat boilers, and utility boilers. Being a post-combustion process, size and type of unit and type of fuel have some, but no major, effect on the process.

There are substantial benefits gained from the application of the **NOxOUT©** Process compared to first generation NOx control technologies, such as ammonia injection. These benefits are:

- Use of non-toxic, non-hazardous chemicals
- Potentially lower capital cost due to the lack of large system compressors and elimination of anhydrous ammonia storage, handling and safety equipment.
- Lower operating costs resulting primarily from minimizing of gas (steam or compressed air) requirements.
- Inherently more effective control of spray patterns and chemical distribution for better mixing with the use of liquid rather than gas-based reagents, thereby resulting in better chemical utilization.
- Chemical enhancers which can be used to improve control of potential by-product generation while reducing NOx over an expanded temperature range.

3.2 System Description

A reagent storage and delivery system is incorporated to inject the SNCR reagent solution into the combustion gases of the boiler. The concentrated reagent (50% urea) is delivered by truck and transferred into the chemical Storage Tank.

The chemical Storage Tank is a closed top vertical tank, fabricated of fiberglass reinforced polyester and premium grand vinylester resin. It is designed per ASTM D3299-88. The tank is supplied with a level indicator, thermocouple, manway, vent, internal down pipe, external fill pipe, ladder, hold down and lifting lugs, and necessary connections and isolation valves. Site conditions determine the locations of the connections and isolating valves. Site conditions will also determine the need for heat trace, insulation and seismic qualifications.

The Circulation Module serves the process in a dual role. While its primary purpose is to supply the concentrated chemical to the Metering Modules, it has a secondary purpose of keeping the chemical at a temperature above 80°F, through constant circulation and, if necessary, a circulation heater. The Module is skid mounted and fully shop tested. It consists of redundant centrifugal pumps, an electric in-line heater, a flowmeter, a duplex strainer, one self-contained control panel, and all associated stainless steel pipe, tubing and valves and instrumentation.

The control panel consists of local controls for the Circulation Module. The heater is controlled by a thermostat and is preset to a temperature of 80°F. When the pump is running, and the temperature falls below the setpoint, the heater will automatically activate. The circulation pump should run at all times. The pressure indicators will show if the system is not running properly. There are temperature and pressure indicators, and a flow meter/indicator for monitoring the correct system operation. The local control panel will also digitally show the tank level and temperature.

The Metering Module is a skid mounted unit used to supply diluted chemical to each Distribution Module. The unit is prepackaged and shop tested and includes a chemical metering pump, turbine pump to supply water pressure boost, an in-line mixer, and a local control panel. At the discharge of the boost pump is a recirculation loop with a pneumatic pressure control valve to control flow and pressures to the injectors. In addition, the module contains all necessary valves, check valves, water strainer, flow transmitters, pressure and flow switches and stainless steel piping/tubing to make it a self-contained metering and pumping system. Redundant pumps with motors are provided.

NOx reduction is a function of the chemical feed rate, which is controlled by varying the speed of the metering pumps through a 4-20 mA signal. Control for the Metering Module is provided at the Local Control Panel or from the plant's DCS. The system will operate in local or remote mode. In the local mode, instrumentation and electrical control is performed at the module. In the remote mode, control is performed from the plant DCS. The module also has a hand/auto mode associated with the metering pump and the water boost pump. When the system is in auto and is turned off, the chemical pump will stop, the chemical valve closes and an automatic water flush occurs. In any mode, the pumps will shutdown for low air pressure, low chemical flow, or low water flow. A low low tank level alarm will shut the metering module down in the auto mode. The flow control for the metering pump also has a local and remote mode. In the remote mode, the metering pump receives a 4-20 mA signal from the DCS which controls the pump motor speed. This controls the chemical feed rate. In the local mode, metering pump control is performed at the local control panel using the digital flow controller. Chemical totalization is provided on the flow indicator.

Mixed chemical is transported from the Metering Module to the Distribution Modules, which channel the mixture to each injector. Each Distribution Module consists of flow meters, balancing valves and regulators which accurately control and display the chemical and atomizing air to each injector. Also contained on these modules are the necessary manual ball valves, gauges and stainless steel tubing required to adequately control the injection

process.

The injectors consist of an atomizing chamber in which the air and chemical mixture first meet. Liquid is sprayed through small orifices forming a jet. The atomizing air shears this jet forming small droplets. The atomized chemical then flows through the injector tube to the nozzle. The nozzle is specially designed and characterized to meet the appropriate plant conditions. The atomized reagent then enters the boiler and mixes with the boiler flue gas to form nitrogen, carbon dioxide and water. Air is required for cooling at any time the injectors are in operation and not retracted from the boiler. The injectors are equipped with quick disconnects and hydraulic hoses for flexibility and ease of maintenance.

The final addition to the injector is an outer cooling air jacket. This shield is attached to the atomizing chamber. Plant air is fed into the coolant air jacket at a low volume and pressure. The air acts as a coolant for the nozzle and the jacket minimizes direct contact between the corrosive flue gas and the injector. This maximizes the useful life of the nozzle in a hostile environment.

4.0 CONTINUOUS EMISSIONS MONITORING SYSTEM

A Continuous Emission Monitoring System is utilized to measure, record and report the performance of the individual boiler trains and their emission control systems to the local Environmental Authorities. Table 1.3 summarizes the data that will be collected. A dedicated multi-component analyzer will be supplied for the inlet of each SDA and the outlet of each FF. An in situ opacity monitor will be installed at each fabric filter outlet. The analyzers are a "Hot-Wet" extractive design. A representative flue gas sample is extracted, filtered and conveyed by heated sampling lines to the analyzer. The analyzer will also be heated to prevent condensation of the moisture in the sample. The outlet test stations are also equipped with opacity monitors. The analyzers are located in an enclosure along with the Data Acquisition System. SO_2 and NO_x signals are fed back via the DCS to the Dry Scrubbing and SNCR Systems. These signals will be used to adjust lime slurry flow (Dry Scrubbing) and NOxOut Solution (SNCR) feed to maintain compliance.

The CEM System is supplied by Aldora. Please refer to their manual for additional information and operating instructions.

5.0 MAJOR AUXILIARY EQUIPMENT LIST

5.1 SPRAY DRYER ABSORBER / FABRIC FILTER AREA

EQUIPMENT NUMBER	ITEM (P&ID 4-21-3-xxx)	TOTAL (Operating + Spare)
04-S-1100 †	Spray Dryer Absorber (-110)	1(1+0)
04-M-1100 †	SDA Live Bottom (-110)	1(1+0)
04-M-1101 A,B,C †	SDA Hopper Impactors (-110)	3(3+0)
04-EV-1101 A,B,C †	SDA Hopper Impactor Solenoids (-110)	3(3+0)
04-M-1560 †	Feed Slurry Final Filter (-110)	1(1+0)
04-M-1104 †	SDA Double Slide Gate (-110)	1(1+0)
04-B-1200 *	Fabric Filter Compt No. 1-1 (-111)	1(1+0)
04-D-1200 *	FF Inlet Damper to Compt No. 1-1 (-111)	1(1+0)
04-D-1210 *	FF Outlet Damper from Compt No. 1-1 (-111)	1(1+0)
04-M-1215 *	FF Hopper Compt No. 1-1 Impactor #1 (-111)	1(1+0)
04-M-1216 *	FF Hopper Compt No. 1-1 Impactor #2 (-111)	1(1+0)
04-M-1218 *	FF Compt No. 1-1 Double Dump Valve (-111)	1(1+0)
04-M-1120 A	FF Compt No. 1-1 Screw Conveyor A (-111/112)	1(1+0)

† This equipment in §6.1 is shown for Unit #1. For Units #2, #3, and #4, the unit number (fourth digit) is changed to 2 for Unit #2 and 3 for Unit #3 and 4 for Unit #4. See following example:

Unit #1 04-M-1202	Unit #3 04-M-3202
Unit #2 04-M-2202	Unit #4 04-M-4202

* This equipment in 6.1 is shown for FF Compt No. 1-1, but is typical for Compt No. 1-2 thru 1-6. For example:

	Compt No. 1-1	04-M-1218	No. 1-4	04-M-1248	
	No. 1-2	04-M-1228	No. 1-5	04-M-1258	
	No. 1-3	04-M-1238	No. 1-6	04-M-1268	
04-M-1120 A	Unit 1 FF Gather Screw Conveyor A (-112)				1(1+0)
04-M-1120 B	Unit 1 FF Gather Screw Conveyor B (-112)				1(1+0)
04-M-1121 A	Unit 1 FF Gather Screw Conv. A Disch. Slide Gate (-112)				1(1+0)
04-M-1121 B	Unit 1 FF Gather Screw Conv. B Disch. Slide Gate (-112)				1(1+0)
04-M-1110	Unit 1 SDA Drag Conveyor (-112)				1(1+0)
04-M-1111	Unit 1 SDA Drag Conveyor Disch. Slide Gate (-112)				1(1+0)
04-M-0130 A	Fly Ash Collecting Conveyor A (-112)				1(1+0)
04-M-0130 B	Fly Ash Collecting Conveyor B (-112)				1(1+0)
04-F-1080	Unit 1 ID Fan (-113)				1(1+0)
04-C-0900 A,B	Atomizing Air Compressors (-125)				2(1+1)
04-T-0910	Atomizing Air Accumulator (-125)				1(1+0)
04-M-0915 A,B	Instrument Air Dryers (-125)				2(1+1)
04-M-0950 A,B	Glycol Air Coolers (-127)				2(1+1)
04-F-0950 A1-A8	Glycol Cooling Fans (-127)				8(8+0)
04-F-0950 B1-B8	Glycol Cooling Fans (-127)				8(8+0)
04-C-0900 A,B	Glycol Air Compressors (-127)				2(1+1)
04-T-0950	Glycol Surge Tank (-127)				1(1+0)
04-P-0950 A,B	Glycol Circulating Pumps (-127)				2(1+1)

5.2 REAGENT PREPARATION AREA

EQUIPMENT NUMBER	ITEM (P&ID 4-21-3-xxx)	TOTAL (Operating + Spare)

04-M-0405	Lime Silo Dust Collector (-120)	1(1+0)
04-T-0400 A,B	Lime Silos (-120)	2(2+0)
04-M-0403 A,B	Lime Silo Live Bottoms (-120)	2(2+0)
04-M-0404 A,B	Lime Feeder Inlet Slide Gates (-120)	2(2+0)
04-M-0401 A,B	Lime Feeders (-120)	2(2+0)
04-F-0400 A,B	Lime Slaker Vapor Extractors (-120)	2(2+0)
04-M-0400 A,B	Lime Slakers (-120)	2(2+0)
04-M-0402 A,B	Lime Slurry Grit Screens (-120)	2(2+0)
04-M-0406	Lime Slurry Grit Screw (-120)	1(1+0)
04-T-0500 A,B	Lime Slurry Storage Tanks (-121)	2(2+0)
04-A-0500 A,B	Lime Slurry Storage Tank Agitators (-121)	2(2+0)
04-P-0500 A1,A2,B1,B2	Lime Slurry Feed Pumps (-121)	4(2+2)
04-T-0600	Dilution Water Tank (-122)	1(1+0)
04-A-0600	Dilution Water Tank Agitator (-122)	1(1+0)
04-P-0600 A,B	Dilution Water Pumps (-122)	2(1+1)
04-P-0820 A,B	Seal Water Pumps (-123)	2(1+1)

5.3 SNCR SYSTEM

EQUIPMENT NUMBER	ITEM (P&ID 4-21-3-xxx)	TOTAL (Operating + Spare)
04-T-0300	SNCR Storage Tank (-130)	1(1+0)
04-P-0300 A,B	SNCR Circulating Pumps (-130)	2(1+1)

04-H-0301	SNCR In-line Heater (-130)	1(1+0)
04-P-1320 A,B	Unit #1 SNCR Metering Pumps (-131)	2(1+1)
04-P-1330 A,B	Unit #1 SNCR Dilution Water Booster Pumps (-131)	2(1+1)

5.4 ACTIVATED CARBON PREPARATION AREA

EQUIPMENT NUMBER	ITEM (P&ID 4-21-3-xxx)	TOTAL (Operating + Spare)
04-M-0702 A	Activated Carbon Silo Dust Collector (-128)	1(1+0)
04-T-0700 A	Activated Carbon Silo (-128)	1(1+0)
04-M-0703 A1,A2,A3	Activated Carbon Silo Slide Gates (-128)	3(2+1)
04-M-0704 A1,A2,A3	Activated Carbon Rotary Valves (-128)	3(2+1)
04-T-0701 A1,A2,A3	Activated Carbon Feed Hoppers (-128)	3(2+1)
04-M-0700 A1,A2,A3	Activated Carbon Feeders (-128)	3(2+1)
04-M-0701 A1,A2,A3	Activated Carbon Eductors (-128)	3(2+1)
04-F-0700 A1,A2,A3	Activated Carbon Blowers (-128)	3(2+1)
09-M-0750	Activated Carbon Air Receiver (-128)	1(1+0)

This equipment in §6.3 is shown for Unit #1. For Units #2, #3, and #4, the unit number (fourth digit) is changed to 2 for Unit #2 and 3 for Unit #3 and 4 for Unit #4. See following example:

Unit #1 04-P-1330 Unit #3 04-P-3330
Unit #2 04-P-2330 Unit #4 04-P-4330

This equipment in §6.4 is shown for SDA Units #1 and #2. For Units #3 and #4, change the letter (A) of the tag/equipment number listed to (B). See following example:

Units #1&2 04-T-0700 A Units #3&4 04-T-0700 B

City of Tampa
McKay Bay Refuse-to-Energy Facility
Title V Permit Renewal Application

Attachment 3:

Equivalency Calculcations

0043047 / FTM

MALCOLM PIRNIE

McKay Bay Refuse to Energy Facility
Title V Renewal Application, File Number 0570127-006-AV
Equivalency Calculations Based On Federal 40 CFR 60 Subpart Cb Standards

Particulate Matter (PM)

New PM limit in 40 CFR 60.33b = 25 mg/dscm, corrected to 7% O_2
MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)
(25 mg/dscm) x (g/1000 mg) x (lb/453.59 g) x (dscm/35.31 dscf) x (7,000 gr/lb) = 0.0109 gr/dscf
(25 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)
x (60 min/hr) = 2.55 lb/hr
(2.55 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 11.19 tons/yr
(2.55 lb/hr) / 120 MMBtu/hr = 0.0213 lb/MMBtu

Cadmium (Cd)

New Cd limit in 40 CFR 60.33b = 0.035 mg/dscm, corrected to 7% O_2
MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)
(0.035 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)
x (60 min/hr) = 0.0036 lb/hr
(0.0036 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.0156 tons/yr
(0.0036 lb/hr) / 120 MMBtu/hr = 0.000030 lb/MMBtu

Mercury (Hg)

New Hg limit in 40 CFR 60.33b = 0.050 mg/dscm, corrected to 7% O_2
MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)
(0.050 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g)
x (60 min/hr) = 0.0051 lb/hr
(0.0051 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.0223 tons/yr
(0.0051 lb/hr) / 120 MMBtu/hr = 0.0000425 lb/MMBtu

Lead (Pb)

New Pb limit in 40 CFR 60.33b = 0.40 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(0.40 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g) x (60 min/hr) = 0.0408 lb/hr

(0.0408 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 0.179 tons/yr

(0.0408 lb/hr) / 120 MMBtu/hr = 0.00034 lb/MMBtu

Hydrogen Chloride (HCl)

HCl limit in 40 CFR 60.33b = 29 ppmdv, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(27,289.8 dscfm) x (60 min/hr) x (29 parts/10^6 parts) x (36.5 lb/lb-mole) x (1 lb-mole/385.3 dscf) = 4.498 lb/hr

(4.498 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 19.7 tons/yr

(4.498 lb/hr) / 120 MMBtu/hr = 0.0375 lb/MMBtu

Sulfur Dioxide (SO_2)

SO_2 limit in 40 CFR 60.33b = 29 ppmdv, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(27,289.8 dscfm) x (60 min/hr) x (29 parts/10^6 parts) x (64.0 lb/lb-mole) x (1 lb-mole/385.3 dscf) = 7.887 lb/hr

(7.887 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 34.5 tons/yr

(7.887 lb/hr) / 120 MMBtu/hr = 0.0657 lb/MMBtu

Dioxins/Furans

Dioxins/Furans limit in 40 CFR 60.33b = 0.000030 mg/dscm, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(0.000030 mg/dscm) x (g/1000 mg) x (dscm/35.31 dscf) x (27,289.8 dscf/min) x (lb/453.59 g) x (60 min/hr) = 3.067E-06 lb/hr

(3.067E-06 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 1.34E-05 tons/yr

(3.067E-06 lb/hr) / 120 MMBtu/hr = 2.55E-08 lb/MMBtu

Nitrogen Oxides (NOx)

NO_x limit in 40 CFR 60.33b = 205 ppmdv, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(27,289.8 dscfm) x (60 min/hr) x (205 parts/10^6 parts) x (46.01 lb/lb-mole) x (1 lb-mole/385.3 dscf)

= 40.08 lb/hr

(40.08 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 175.5 tons/yr

(40.08 lb/hr) / 120 MMBtu/hr = 0.334 lb/MMBtu

Carbon Monoxide (CO)

CO limit in 40 CFR 60.33b = 100 ppmdv, corrected to 7% O_2

MWC Flowrate = 27,289.8 dscfm (original retrofit modeled flowrate corrected to 7% O_2)

(27,289.8 dscfm) x (60 min/hr) x (100 parts/10^6 parts) x (28.0 lb/lb-mole) x (1 lb-mole/385.3 dscf)

= 11.9 lb/hr

(11.9 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 52.1 tons/yr

(11.9 lb/hr) / 120 MMBtu/hr = 0.0992 lb/MMBtu