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APR 12 2013

DIVISION OF AIR RESOURCE MANAGEMENT

Tammy - Module AB170

AIR CONSTRUCTION PERMIT APPLICATION FOR NATURAL GAS FIRING IN THE NO. 4 RECOVERY BOILER

Georgia-Pacific Consumer Operations LLC
Palatka Mill

Project # 1070005-080-AC

PERMIT APPLICATION

Prepared For: Georgia-Pacific Consumer Operations LLC – Palatka Mill
North 8th Street
Palatka, FL 32034 USA

Submitted By: Golder Associates Inc.
6026 NW 1st Place
Gainesville, FL 32607 USA

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NORTHEAST DISTRICT
DEP-JACKSONVILLE

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April 2013

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Golder Associates

APPLICATION FOR AIR PERMIT

LONG FORM

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NORTHEAST DISTRICT DEP-JACKSONVILLE

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

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NORTHEAST DISTRICT DEP-JACKSONVILLE

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Georgia-Pacific Consumer Operations LLC**	
2. Site Name: **Palatka Mill**	
3. Facility Identification Number: **1070005**	
4. Facility Location... Street Address or Other Locator: **215 County Road 216** City: **Palatka** County: **Putnam** Zip Code: **32177**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Ron Reynolds, Environmental Engineer – Air Quality**
2. Application Contact Mailing Address... Organization/Firm: **Georgia-Pacific Consumer Operations LLC** Street Address: **P.O. Box 919** City: **Palatka** State: **FL** Zip Code: **32178-0919**
3. Application Contact Telephone Numbers... Telephone: **(386) 329-0967** ext. Fax: **(386) 328-0014**
4. Application Contact E-mail Address: **ron.reynolds@gapac.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 4-12-13	3. PSD Number (if applicable):
2. Project Number(s): 1070005-080-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

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

Air Construction Permit

- ☒ Air construction permit.
- ☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).
- ☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

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

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

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

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

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

Application Comment

This application is to replace the existing fuel oil burners in the No. 4 Recovery Boiler (EU 018) with natural gas burners.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
018	No. 4 Recovery Boiler	N/A	N/A

Application Processing Fee

Check one: ☐ Attached - Amount: $______________ ☒ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

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

1.	Owner/Authorized Representative Name : **Gary L. Frost, Vice-President Operations**
2.	Owner/Authorized Representative Mailing Address... Organization/Firm: **Georgia-Pacific Consumer Operations LLC** Street Address: **P.O. Box 919** City: **Palatka** State: **FL** Zip Code: **32178**
3.	Owner/Authorized Representative Telephone Numbers... Telephone: **(386) 329-0063** ext. Fax: **(386) 312-1135**
4.	Owner/Authorized Representative E-mail Address: **gary.frost@gapac.com**
5.	Owner/Authorized Representative Statement: *I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.* Signature 11 APR 2013 Date

APPLICATION INFORMATION

Application Responsible Official Certification

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

1. Application Responsible Official Name:
2. Application Responsible Official Qualification (Check one or more of the following options, as applicable): ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C. ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively. ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official. ☐ The designated representative at an Acid Rain source or CAIR source.
3. Application Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
4. Application Responsible Official Telephone Numbers... Telephone: ( ) ext. Fax: ( )
5. Application Responsible Official E-mail Address:
6. Application Responsible Official Certification: I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application. Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1.	Professional Engineer Name: **Philip D. Cobb** Registration Number: **72386**
2.	Professional Engineer Mailing Address... Organization/Firm: **Golder Associates Inc.**** Street Address: **6026 NW 1st Place** City: **Gainesville** State: **FL** Zip Code: **32607**
3.	Professional Engineer Telephone Numbers... Telephone: **(352) 336-5600** ext. Fax: **(352) 336-6603**
4.	Professional Engineer E-mail Address: **pcobb@golder.com**
5.	Professional Engineer Statement: *I, the undersigned, hereby certify, except as particularly noted herein*, that:* *(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and* *(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.* *(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.* *(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.* *(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.* Signature 4/11/2013 Date (seal)

* Attach any exception to certification statement.
**Board of Professional Engineers Certificate of Authorization #00001670.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **17** East (km) **434.0** North (km) **3,283.4**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **29 / 41 / 00** Longitude (DD/MM/SS) **81 / 40 / 45**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **26**	6. Facility SIC(s): **2611** **2621**
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: **Ron Reynolds, Environmental Engineer – Air Quality**
2. Facility Contact Mailing Address... Organization/Firm: **Georgia-Pacific Consumer Operations LLC** Street Address: **P.O. Box 919** City: **Palatka** State: **FL** Zip Code: **32178**
3. Facility Contact Telephone Numbers: Telephone: **(386) 329-0967** ext. Fax: **(386) 328-0014**
4. Facility Contact E-mail Address: **ron.reynolds@gapac.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) ext. Fax: ( )
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

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

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment:	

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
Particulate Matter Total – PM	A	N
Particulate Matter – PM10	A	N
Particulate Matter – PM2.5	A	N
Sulfur Dioxide – SO2	A	N
Nitrogen Oxides – NOx	A	N
Carbon Monoxide – CO	A	N
Volatile Organic Compounds – VOC	A	N
Lead – Pb	A	N
Sulfuric Acid Mist – SAM	A	N
Total Reduced Sulfur – TRS	A	N
Hazardous Air Pollutants – HAPS	A	N
GHG (mass basis)	A	N
GHG (CO2e basis)	A	N
Acetaldehyde – H001	A	N
Biphenyl – H022	A	N
Cresols – H049	A	N
Hydrogen Chloride – H106	A	N
Methanol – H115	A	N
Phenol – H144	A	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

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

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Facility Plot 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: GP-FI-C1 ☐ Previously Submitted, Date:___________	
2. Process Flow Diagram(s): (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: GP-FI-C2 ☐ Previously Submitted, Date:___________	
3. Precautions to Prevent Emissions of Unconfined Particulate Matter: (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: GP-FI-C3 ☐ Previously Submitted, Date:___________	

Additional Requirements for Air Construction Permit Applications

1. Area Map Showing Facility Location: ☐ Attached, Document ID:__________ ☒ Not Applicable (existing permitted facility)	
2. Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☒ Attached, Document ID: Part B	
3. Rule Applicability Analysis: ☒ Attached, Document ID: Part B	
4. List of Exempt Emissions Units: ☐ Attached, Document ID:__________ ☒ Not Applicable (no exempt units at facility)	
5. Fugitive Emissions Identification: ☐ Attached, Document ID:__________ ☒ Not Applicable	
6. Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☐ Attached, Document ID:__________ ☒ Not Applicable	
7. Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☐ Attached, Document ID:__________ ☒ Not Applicable	
8. Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☐ Attached, Document ID:__________ ☒ Not Applicable	
9. Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID:__________ ☒ Not Applicable	
10. Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:__________ ☒ Not Applicable	

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units: ☐ Attached, Document ID:__________ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications

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

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

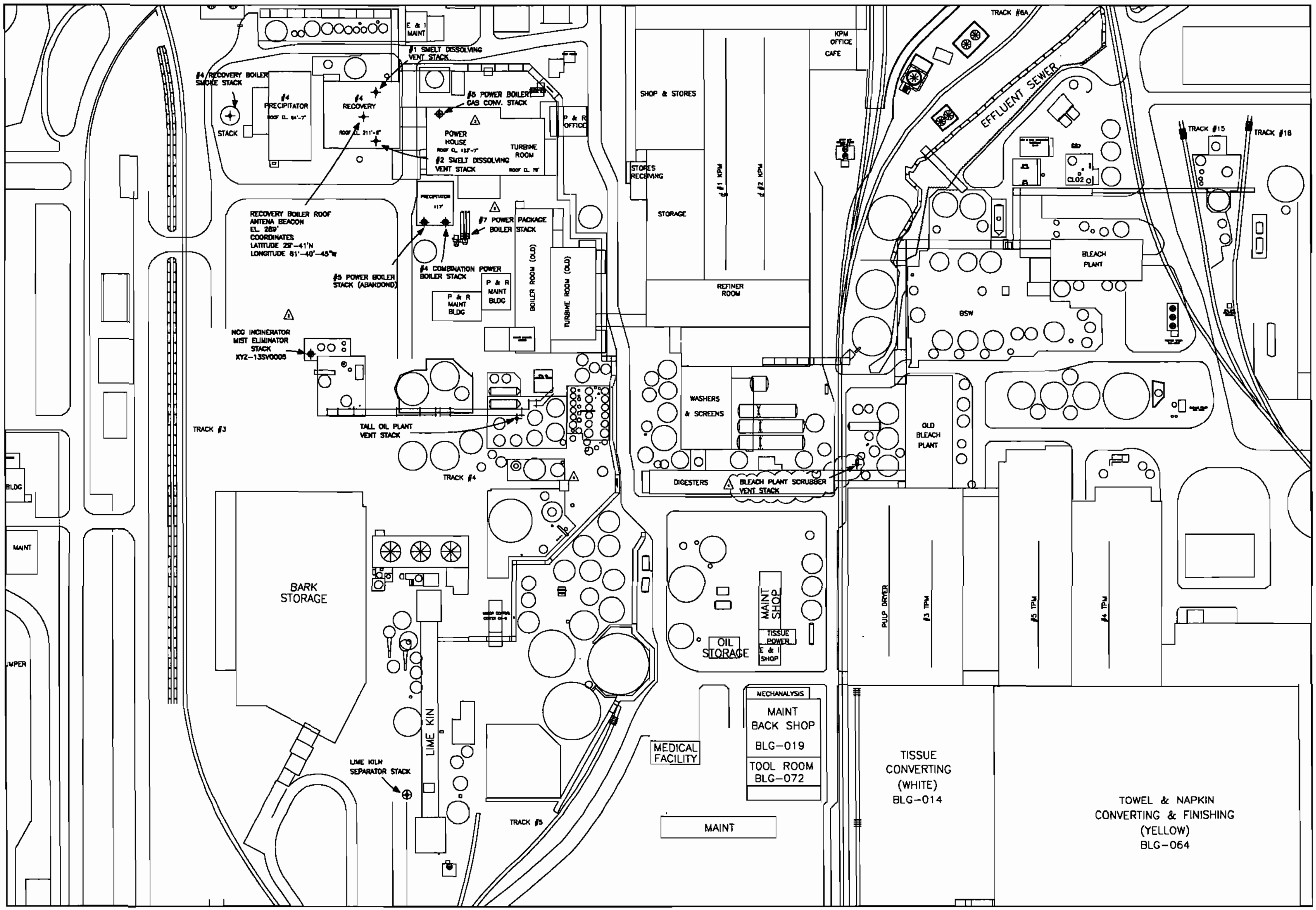
Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1.	Acid Rain Program Forms: Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☒ Not Applicable (not an Acid Rain source) Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☒ Not Applicable New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☒ Not Applicable
2.	CAIR Part (DEP Form No. 62-210.900(1)(b)): ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:__________ ☒ Not Applicable (not a CAIR source)

Additional Requirements Comment

ATTACHMENT GP-FI-C1

FACILITY PLOT PLAN



MILL STACKS

		EQUIP NO.	BASE EL.	HEIGHT	STACK EL.	ID.	REF. DWG.	REF. DWG.
	NCG INCINERATOR MIST ELIMINATOR STACK	XYZ-13SV0005	20'	250'-1 1/2'	270'-1 1/2"	25.5"	G-P 291-8595ME-000-0039-002	
	#4 COMBINATION BOILER STACK	BHP-2003	121'-6"	133'-8	255'-2"	8'	Research - Cottrell 291-5219/5220-1-03	
ABANDON	#5 POWER BOILER STACK	BHP-2000	121'-6"	133'-8"	255'-2"	8'	Research - Cottrell 291-5219/5220-1-03	
	#5 POWER BOILER GAS CONVERSION STACK	BHP-	123'-7 1/8"	50'-0"	173'-7 1/8"	9'	G-P 291-5220ME-002-0015-004, 005	
	#4 RECOVERY BOILER SMOKE STACK	XYZ-5521	19'	230'	249'	12'	Rust Eng. 27-68-37	Peabody Dwg. 5170-2
	#1 SMELT DISSOLVING VENT STACK	XYZ-5514	33'-3"	188'-9"	222'	4'-11"	Rust Eng. 27-68-51	Zurn Dwg. 6-750-DE1
	#2 SMELT DISSOLVING VENT STACK	XYZ-5515	33'-3"	188'-9"	222'	4'-11"	Rust Eng. 27-68-51	Zurn Dwg. 6-750-DE2X
	LIME KILN SEPARATOR STACK	SPR-5057	71'-6"	77'-6"	149'	4'-5 1/4"	Rust Eng. 27-16-50	Zurn Dwg. C-38470-2, D-39848
	TALL OIL PLANT VENT STACK		19'-0"	64'-6"	83'-6"	1'-4"	G-P 297-7810-034	Wallace-Murray Dwg. File 297-7810-12-01
	#7 POWER PACKAGE BOILER STACK	BHP-2007	36' ±	20'-4"	56' ±	6'	G-P 291-5220-001-0019-002	
	BLEACH PLANT SCRUBBER VENT STACK	XYZ-	27'-1"	81'-8"	108'-9"	3'-7"	G-P 295-5614-302-05	

CONSULTANT NO.

NOTES

REV.	DATE	DESCRIPTION	DRN. / CHK'D	AP'D
4	[illegible]	ADDED BLEACH PLANT SCRUBBER STACK	VHT	
3	[illegible]	ADDED NO.5 POWER BLR GAS CONV. STACK	VHT	
2	[illegible]	NO. 7 POWER PACKAGE BOILER WAS NO.6	VHT	
		ADDED NCG INCINERATOR MIST ELIM. STACK		
1	[illegible]	REPLACED BORDER	VHT	

CROSS-REFERENCE NO.

HUDSON NO.

Georgia-Pacific

THE GROWTH COMPANY

PALATKA OPERATIONS

MILL STACKS
LOCATION PLAN
POLLUTION CONTROL

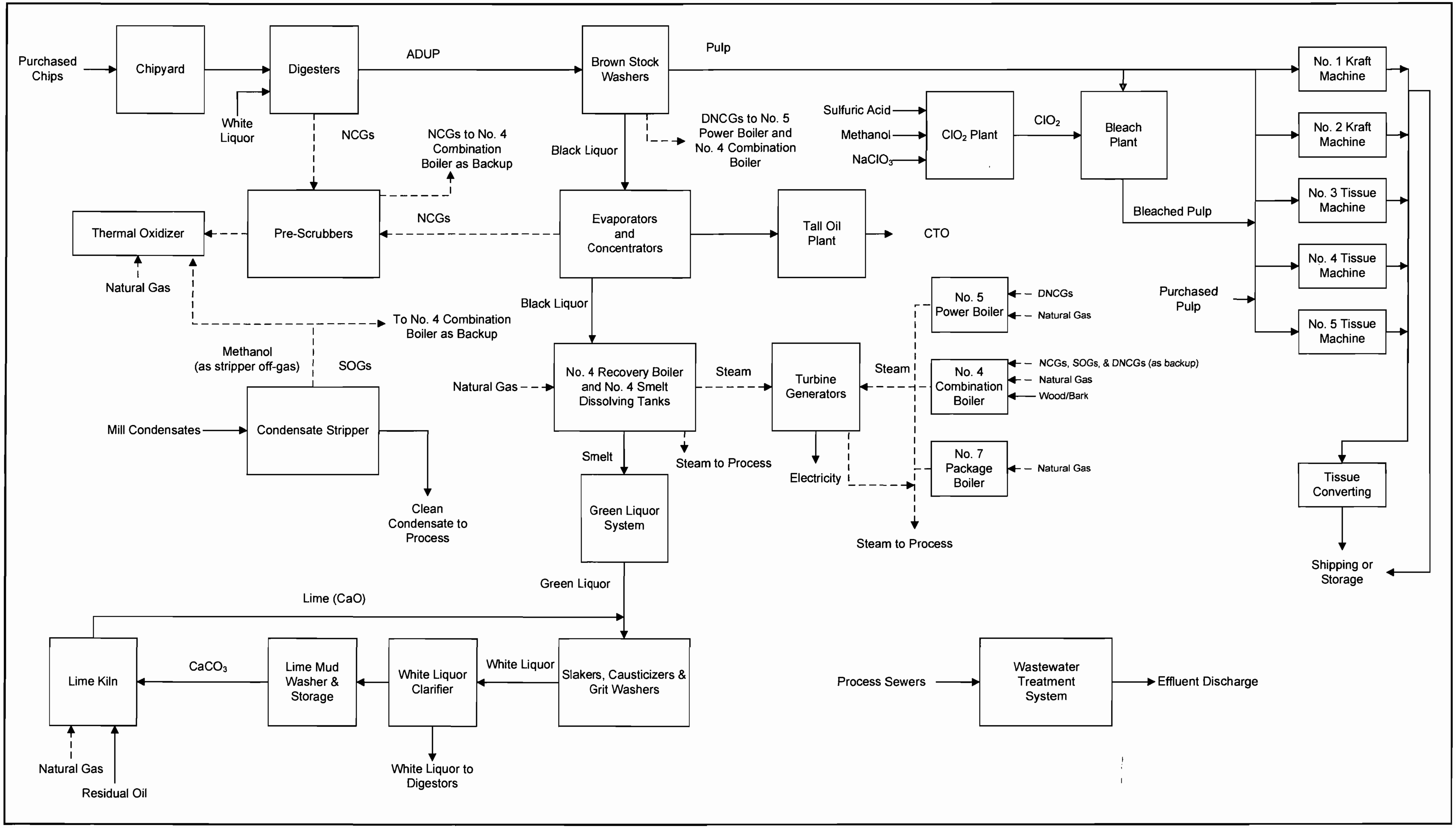
DRAWN	VHT	10/20/99	SCALE -
CHECKED	.	.	RES NO. -
APPROVED	.	.	FILENAME [illegible].dwg
APPROVED	.	.	AREA 83

G-P DRAWING NO. 290-8464MS-000-0016-001

CONSULTANT — REV: 4

ATTACHMENT GP-FI-C2

PROCESS FLOW DIAGRAM



Attachment GP-FI-C2
Facility Process Flow Diagram
Georgia-Pacific Palatka Operations
Palatka, Florida

Notes:
ADUP = Air Dried Unbleached Pulp
CTO = Crude Tall Oil
Solid/Liquid ⟶
Gas - - - - ->

Golder Associates

ATTACHMENT GP-FI-C3

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

ATTACHMENT GP-FI-C3

PRECAUTIONS TO PREVENT EMISSIONS OF UNCONFINED PARTICULATE MATTER

Reasonable precautions to prevent emissions of unconfined particulate matter at this facility include:

- Conveyors that are covered or enclosed where feasible and practical
- Paved roads entering and exiting the plant
- Limiting vehicle speeds
- Good housekeeping practices

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.

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:
   No. 4 Recovery Boiler

3. Emissions Unit Identification Number: **018**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
A	**September 1974**	**December 1976**	**26**

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

   ☐ Acid Rain Unit

   ☐ CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
    The No. 4 Recovery Boiler fires black liquor solids (BLS) to recover the cooking liquor. Its total maximum operational rate is 210,000 pounds per hour (lb/hr) BLS based on a 24-hour average. Natural gas is fired as a startup, shutdown, and supplemental fuel.

Emissions Unit Control Equipment/Method: Control 1 of 3

1. Control Equipment/Method Description: **Electrostatic Precipitator – High Efficiency**	
2. Control Device or Method Code: **010**	

Emissions Unit Control Equipment/Method: Control 2 of 3

1. Control Equipment/Method Description: **Overfire Air**	
2. Control Device or Method Code: **204**	

Emissions Unit Control Equipment/Method: Control 3 of 3

1. Control Equipment/Method Description: **Combustion design and good operating practices**	
2. Control Device or Method Code: **099**	

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: **210,000 lb/hr Black Liquor Solids (BLS)**			
2. Maximum Production Rate:			
3. Maximum Heat Input Rate: **1,345** million Btu/hr			
4. Maximum Incineration Rate:	pounds/hr 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: **Process rate based on 24-hour average. Maximum heat input rate based on average heating value of 6,410 Btu/lb for BLS.** **Maximum natural gas combustion limited to 10 percent of the maximum permitted heat input on an annual basis. Total heat input from natural gas burners (startup and load burners) is 664 MMBtu/hr.**			

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: **No. 4 Recovery Boiler**		2. Emission Point Type Code: **1**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **230** feet	7. Exit Diameter: **12.0** feet
8. Exit Temperature: **393**°F	9. Actual Volumetric Flow Rate: **354,153** acfm	10. Water Vapor: **25** %
11. Maximum Dry Standard Flow Rate: **294,000** dscfm **@ 8% oxygen**		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: **17** East (km): **433.9025** North (km): **3,283.6442**		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **Stack parameters (exit temperature, actual volumetric flow rate, and water vapor) based on July 20, 2012 stack test.** **Maximum dry standard flow rate based on maximum design flow rate.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **Pulp and Paper and Wood Products; Sulfate (Kraft) Pulping; Recovery Furnace/Indirect Contact Evaporator**		
2. Source Classification Code (SCC): **3-07-001-10**	3. SCC Units: **Tons Air-Dried Unbleached Pulp Produced**	
4. Maximum Hourly Rate: **118**	5. Maximum Annual Rate: **675,250**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **11.4**
10. Segment Comment: **All BLS from pulp production can be sent to the Recovery Boiler. No. 4 Recovery Boiler is limited by permit to 210,000 lb/hr BLS (24-hour average). Capacity of Pulp Mill = 118 tons per hour and 1,850 tons per day ADUP.**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **External Combustion Boilers; Industrial; Natural Gas > 100 Million Btu/hr**		
2. Source Classification Code (SCC): **1-02-006-01**	3. SCC Units: ***Million Cubic Feet Burned***	
4. Maximum Hourly Rate: **0.664**	5. Maximum Annual Rate: **1,178.220**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **1,000**
10. Segment Comment: **Natural gas used during startup, shutdown, and as an alternative fuel. Maximum hourly rate based on 664 MMBtu/hr. Maximum annual rate based on limitation of 10 percent of annual heat input from fossil fuels (1,178,220 MMBtu/yr).**		

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	010		EL
PM10	010		NS
PM2.5	010		NS
SO2			EL
NOx	204		EL
CO	099		EL
VOC	099		EL
Pb			NS
SAM			EL
TRS			EL
H001 – Acetaldehyde			NS
H021 – Beryllium			EL
H053 – Cumene			NS
H095 – Formaldehyde			NS
H106 – Hydrogen Chloride			NS
H114 – Mercury			NS
H115 – Methanol			NS
H144 – Phenol			NS
H154 – Proprionaldehyde			NS
HAPS			NS
H2S			NS
GHG (mass basis)			NS
GHG (CO2e basis)			NS
			NS
			NS
			NS
			NS
			NS
			NS
			NS
			NS
			NS
			NS
			NS

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: **292.8** lb/hour **153.9** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **100 ppmvd @ 8% oxygen (24-hour average)** Reference: **Permit No. 1070005-050-AC**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **78.75** tons/year	8.b. Baseline 24-month Period: From: **12/2010** To: **11/2012**
9.a. Projected Actual Emissions (if required): **39.78** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:

100 ft^3 / 10^6 ft^3 x 294,000 dscf/min x 2,116.8 lb_f/ft^2 x 1 lb_m-°R/1,545.6 ft-lb_f x 1/528°R x 64 lb_m/lb_{mol} x 60 min/hr = 292.8 lb/hr

Annual: 153.9 TPY (Permit Limit)

11. Potential, Fugitive, and Actual Emissions Comment:
Potential hourly emissions are based on a 24-hour average. Potential annual emissions based on permit limit (Permit No. 1070005-050-AC) and exclude startup/shutdown emissions.

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 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **100 ppmvd @ 8% O_2 (24-hour average)**	4. Equivalent Allowable Emissions: **292.8** lb/hour **1,282.5** tons/year
5. Method of Compliance: **SO_2 CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 1070005-050-AC. Allowable emissions exclude startup/shutdown emissions.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **153.9 TPY (12-month rolling)**	4. Equivalent Allowable Emissions: lb/hour **153.9** tons/year
5. Method of Compliance: **SO_2 CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Permit No. 1070005-050-AC. Allowable emissions include all periods of startup, shutdown, and malfunction.**	

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):	

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: **168.5** lb/hour **738.1** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **80 ppmvd @ 8% oxygen (30-day rolling average)** Reference: **Permit No. AC54-266676/PSD-FL-226**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **472.18** tons/year	8.b. Baseline 24-month Period: From: **07/2005** To: **06/2007**
9.a. Projected Actual Emissions (if required): **507.97** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:
$80\ ft^3 / 10^6\ ft^3 \times 294{,}000\ dscf/min \times 2{,}116.8\ lb_f/ft^2 \times 1\ lb_m\text{-}°R/1{,}545.6\ ft\text{-}lb_f \times 1/528°R \times 46\ lb_m/lb_{mol} \times 60\ min/hr = 168.5\ lb/hr$

Annual: 168.5 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 738.1 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

Potential hourly emissions are based on a 30-day rolling average and exclude startup/shutdown emissions.

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **80 ppmvd @ 8% O2 (30-day rolling average)**	4. Equivalent Allowable Emissions: **168.5** lb/hour **738.1** tons/year
5. Method of Compliance: **NOx CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. AC54-266676/PSD-FL-226. Allowable emissions exclude startup/shutdown emissions.**	

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):	

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: **512.7** lb/hour **2,245.6** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **400 ppmvd @ 8% oxygen (30-day rolling average)** Reference: **Permit No. 1070005-038-AC/PSD-FL-380**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **1,225.28** tons/year	8.b. Baseline 24-month Period: From: **10/2006** To: **09/2008**
9.a. Projected Actual Emissions (if required): **1,265.04** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:

400 ft^3 / 10^6 ft^3 x 294,000 dscf/min x 2,116.8 lb_f/ft^2 x 1 lb_m-°R/1,545.6 ft-lb_f x 1/528°R x 28 lb_m/lb_{mol} x 60 min/hr = 512.7 lb/hr

Annual: 512.7 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 2,245.6 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

Emissions exclude startup/shutdown emissions.

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **400 ppmvd @ 8% O_2 (30-day rolling avg)**	4. Equivalent Allowable Emissions: **512.7** lb/hour **2,245.6** tons/year
5. Method of Compliance: **CO CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. 1070005-038-AC/PSD-FL-380. Hourly emissions based on 30-day rolling average. Allowable emissions exclude startup/shutdown emissions.**	

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):	

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: **75.6** lb/hour **331.1** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.030 grains/dscf @ 8% oxygen** Reference: **Permit No. 1070005-038-AC/PSD-FL-380**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **97.88** tons/year	8.b. Baseline 24-month Period: From: **01/2005** To: **12/2006**
9.a. Projected Actual Emissions (if required): **84.80** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 294,000 dscf/min x 0.030 gr/dscf x 60 min/hr x 1 lb/7,000 gr = 75.6 lb/hr

Annual: 75.6 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 331.1 TPY

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 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.030 grains/dscf @ 8% O_2**	4. Equivalent Allowable Emissions: **75.6** lb/hour **331.1** tons/year
5. Method of Compliance: **EPA Method 5 or 29**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. 1070005-038-AC/PSD-FL-380.**	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **RULE**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.044 grains/dscf @ 8% O_2**	4. Equivalent Allowable Emissions: **110.9** lb/hour **485.7** tons/year
5. Method of Compliance: **EPA Method 5 or 29**	
6. Allowable Emissions Comment (Description of Operating Method): **40 CFR 63 Subpart MM.**	

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):	

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: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **53.9** lb/hour **236.1** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **71.3-percent of PM emissions** Reference: **NCASI TB 884, Table 4.12, median value**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): **94.97** tons/year	8.b. Baseline 24-month Period: From: **01/2005** To: **12/2006**
9.a. Projected Actual Emissions (if required): **90.07** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 75.6 lb/hr x 0.713 lb PM_{10}/lb PM = 53.9 lb/hr

Annual: 53.9 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 236.1 TPY

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):	

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):	

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: **PM2.5**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **37.6** lb/hour **164.7** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **49.8-percent of PM emissions** Reference: **NCASI TB 884, Table 4.12, median value**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **73.92** tons/year	8.b. Baseline 24-month Period: From: **01/2005** To: **12/2006**
9.a. Projected Actual Emissions (if required): **72.08** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 75.6 lb/hr x 0.498 lb PM_{10}/lb PM = 37.6 lb/hr

Annual: 37.6 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 164.7 TPY

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):	

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):	

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: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **21.0** lb/hour **92.0** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.2 lb/ton BLS** Reference: **Permit No. 1070005-038-AC/PSD-FL-380**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **20.53** tons/year	8.b. Baseline 24-month Period: From: **12/2006** To: **11/2008**
9.a. Projected Actual Emissions (if required): **34.83** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years
10. Calculation of Emissions: **Hourly: 0.2 lb/ton BLS x 210,000 lb BLS/hr x 1 ton/2,000 lb = 21.0 lb/hr** **Annual: 21.0 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 92.0 TPY**	
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 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 lb/ton BLS**	4. Equivalent Allowable Emissions: **21.0** lb/hour **92.0** tons/year
5. Method of Compliance: **EPA Method 25A**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. 1070005-038-AC/PSD-FL-380.**	

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):	

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: **SAM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **3.6** lb/hour **15.9** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.81 ppmvd** Reference: **Permit No. AC54-266676/PSD-FL-226**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **3.40** tons/year	8.b. Baseline 24-month Period: From: **10/2010** To: **09/2012**
9.a. Projected Actual Emissions (if required): **1.11** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:

$0.81\ ft^3 / 10^6\ ft^3 \times 294{,}000\ dscf/min \times 2{,}116.8\ lb_f/ft^2 \times 1\ lb_m\text{-}°R/1{,}545.6\ ft\text{-}lb_f \times 1/528°R \times 98\ lb_m/lb_{mol} \times 60\ min/hr = 3.6\ lb/hr$

Annual: 3.6 lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = 15.9 TPY

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 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.81 ppmvd**	4. Equivalent Allowable Emissions: **3.6** lb/hour **15.9** tons/year
5. Method of Compliance: **EPA Method 8**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. AC54-266676/PSD-FL-226.**	

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):	

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: **TRS**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **7.8** lb/hour **34.2** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **34.2 TPY (12-month rolling total)** Reference: **Permit No. 1070005-038-AC/PSD-FL-380**	7. Emissions Method Code: **0**
8.a. Baseline Actual Emissions (if required): **8.15** tons/year	8.b. Baseline 24-month Period: From: **01/2005** To: **12/2006**
9.a. Projected Actual Emissions (if required): **6.05** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 34.2 TPY (Permit Limit) x 2,000 lb/ton x 1 yr/8,760 hr = 7.8 lb/hr

Annual: 34.2 TPY (Permit Limit)

11. Potential, Fugitive, and Actual Emissions Comment:

Potential emissions are based on a 30-day rolling total. Potential annual emissions based on Permit No. 1070005-038-AC/PSD-FL-380.

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: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **34.2 TPY (12-month rolling total)**	4. Equivalent Allowable Emissions: **7.8** lb/hour **34.2** tons/year
5. Method of Compliance: **TRS CEMS**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT) and Permit No. 1070005-038-AC/PSD-FL-380. Hourly emissions based on a 12-month rolling average.**	

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):	

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.

<u>Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions</u>

1. Pollutant Emitted: **Pb**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **$1.0x10^{-3}$** lb/hour **$4.5x10^{-3}$** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **$9.81x10^{-6}$ lb/ton BLS** Reference: **NCASI TB No. 973, Table 4.24, median value**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): **$5.65x10^{-3}$** tons/year	8.b. Baseline 24-month Period: From: **02/2008** To: **01/2010**
9.a. Projected Actual Emissions (if required): **$4.33x10^{-3}$** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 210,000 lb/hr BLS x 1 ton/2,000 lb x $9.81x10^{-6}$ lb/ton BLS = $1.0x10^{-3}$ lb/hr

Annual: $1.0x10^{-3}$ lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = $4.5x10^{-3}$ TPY

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):	

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):	

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: **Hg**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **$3.5x10^{-4}$** lb/hour **$1.6x10^{-3}$** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **$3.38x10^{-6}$ lb/ton BLS** Reference: **NCASI TB No. 973, Table 4.24, median value**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): **$1.42x10^{-3}$** tons/year	8.b. Baseline 24-month Period: From: **10/2006** To: **09/2008**
9.a. Projected Actual Emissions (if required): **$1.54x10^{-3}$** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly: 210,000 lb/hr BLS x 1 ton/2,000 lb x $3.38x10^{-6}$ lb/ton BLS = $3.5x10^{-4}$ lb/hr

Annual: $3.5x10^{-4}$ lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = $1.6x10^{-3}$ TPY

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):	

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):	

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: **GHGs**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **77,616** lb/hour **33,996** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **116.89 lb/MMBtu CO_2 from natural gas** Reference: **40 CFR 98 Subpart C, Tables C-1 and C-2**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): **36,975** tons/year	8.b. Baseline 24-month Period: From: **06/2008** To: **05/2010**
9.a. Projected Actual Emissions (if required): **69,233** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:

CO_2: 664 MMBtu/hr x 116.89 lb/MMBtu = 77,614 lb/hr
CH_4: 664 MMBtu/hr x 0.0022 lb/MMBtu = 1.46 lb/hr
N_2O: 664 MMBtu/hr x 0.00022 lb/MMBtu = 0.15 lb/hr
Total: 77,614 lb/hr + 1.46 lb/hr + 0.15 lb/hr = 77,616 lb/hr

Annual:

CO_2: 77,614 lb/hr x 8,760 hr/yr x 10% capacity factor x 1 ton/2,000 lb = 33,995 TPY
CH_4: 1.46 lb/hr x 8,760 hr/yr x 10% capacity factor x 1 ton/2,000 lb = 0.64 TPY
N_2O: 0.15 lb/hr x 8,760 hr/yr x 10% capacity factor x 1 ton/2,000 lb = 0.06 TPY
Total: 33,995 TPY + 0.64 TPY + 0.06 TPY = 33,996 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

Represents worst case emissions scenario.

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):	

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):	

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: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **77,690** lb/hour **34,028** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **CO_2 = 1, CH_4 = 21, N_2O = 310** Reference: **40 CFR 98 Subpart A**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): **56,077** tons/year	8.b. Baseline 24-month Period: From: **06/2008** To: **05/2010**
9.a. Projected Actual Emissions (if required): **92,067** tons/year	9.b. Projected Monitoring Period: ☒ 5 years ☐ 10 years

10. Calculation of Emissions:

Hourly:

CO_2: 77,614 lb/hr x 1 = 77,614 lb/hr
CH_4: 1.46 lb/hr x 21 = 30.74 lb/hr
N_2O: 0.15 lb/hr x 310 = 45.38 lb/hr
Total: 77,614 lb/hr + 30.74 lb/hr + 45.38 lb/hr = 77,690 lb/hr

Annual:

CO_2: 33,995 TPY x 1 = 33,995 TPY
CH_4: 0.64 TPY x 21 = 13.46 TPY
N_2O: 0.06 TPY x 310 = 19.88 TPY
Total: 33,995 TPY + 13.46 TPY + 19.88 TPY = 34,028 TPY

11. Potential, Fugitive, and Actual Emissions Comment:

Represents worst case emissions scenario.

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):	

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):	

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**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **$6.4x10^{-4}$** lb/hour **$2.8x10^{-3}$** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.475 lb/10^{12} Btu** Reference: **Permit No. AC54-266676/PSD-FL-226**	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:

Hourly: 1,345 MMBtu/hr x 0.475 lb/10^{12} Btu x 10^{12} Btu/1,000,000 MMBtu = $6.4x10^{-4}$ lb/hr

Annual: $6.4x10^{-4}$ lb/hr x 8,760 hr/yr x 1 ton/2,000 lb = $2.8x10^{-3}$ TPY

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 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.475 lb/10^{12} Btu**	4. Equivalent Allowable Emissions: **6.4×10^{-4}** lb/hour **2.8×10^{-3}** tons/year
5. Method of Compliance: **EPA Method 104**	
6. Allowable Emissions Comment (Description of Operating Method): **Rule 62-212.400(BACT), F.A.C. and Permit No. AC54-266676/PSD-FL-226**	

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: **VE20**	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9 (6-minute average)**	
5. Visible Emissions Comment: **40 CFR 63, Subpart MM and Permit No. 1070005-038-AC/PSD-FL-380**	

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:	

EMISSIONS UNIT INFORMATION
Section [1]
No. 4 Recovery Boiler

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 6

1. Parameter Code: **EM**	2. Pollutant(s): **TRS**
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **Thermo Electron** Model Number: **43C**	Serial Number: **67324-356**
5. Installation Date:	6. Performance Specification Test Date: **3/28/2012**
7. Continuous Monitor Comment: **Rule 62-296.404(5), F.A.C.**	

Continuous Monitoring System: Continuous Monitor 2 of 6

1. Parameter Code: **EM**	2. Pollutant(s): **CO**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **TEI** Model Number: **Thermo 48C**	Serial Number: **330102710**
5. Installation Date:	6. Performance Specification Test Date: **3/28/2012**
7. Continuous Monitor Comment: **Permit No. 1070005-038-AC/PSD-FL-380**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

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

Continuous Monitoring System: Continuous Monitor 3 of 6

1. Parameter Code: **EM**	2. Pollutant(s): **SO2**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **TEI** Model Number: **Thermo 43C**	Serial Number: **67563357**
5. Installation Date:	6. Performance Specification Test Date: **3/28/2012**
7. Continuous Monitor Comment: **Permit No. 1070005-050-AC**	

Continuous Monitoring System: Continuous Monitor 4 of 6

1. Parameter Code: **EM**	2. Pollutant(s): **NOx**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: **TEI** Model Number: **Thermo 42I**	Serial Number: **723424630**
5. Installation Date:	6. Performance Specification Test Date: **3/28/2012**
7. Continuous Monitor Comment: **Permit No. 1070005-038-AC/PSD-FL-380**	

H. CONTINUOUS MONITOR INFORMATION (CONTINUED)

Continuous Monitoring System: Continuous Monitor 5 of 6

1. Parameter Code: **VE**	2. Pollutant(s):
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **Thermo Environmental** Model Number: **Model 440**	Serial Number: **440A75673B13380**
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **40 CFR 63, Subpart MM, Rule 62-212.400(BACT), F.A.C., and Permit No. 1070005-038-AC / PSD-FL-380**	

Continuous Monitoring System: Continuous Monitor 6 of 6

1. Parameter Code: **O2**	2. Pollutant(s):
3. CMS Requirement:	☒ Rule ☐ Other
4. Monitor Information... Manufacturer: **Citi Technologies** Model Number: **2FO**	Serial Number:
5. Installation Date:	6. Performance Specification Test Date: **3/28/2012**
7. Continuous Monitor Comment: **Rule 62-296.404(5)(b), F.A.C.**	

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: GP-EU1-I1 ☐ 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: GP-EU1-I2 ☐ 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: GP-EU1-I3 ☐ 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: ________ ☐ 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: GP-EU1-I5 ☐ 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: Part B ☐ 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

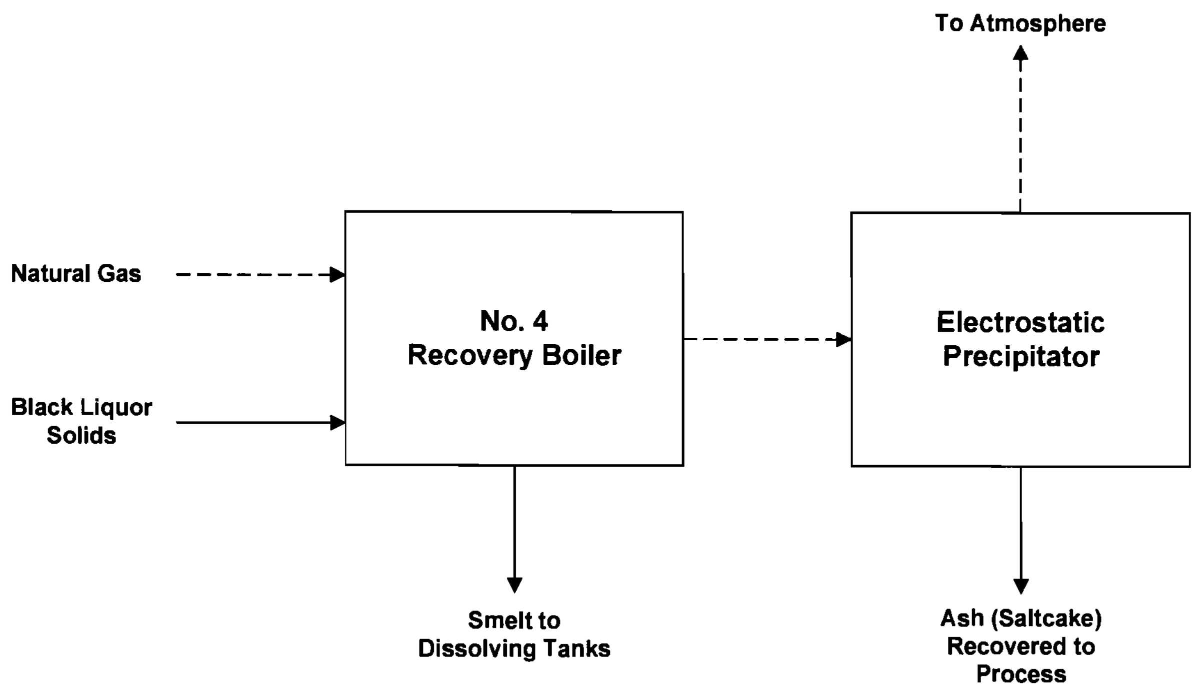
Additional Requirements for Title V Air Operation Permit Applications

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: ____________
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: ____________ ☐ 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

ATTACHMENT GP-EU1-I1

PROCESS FLOW DIAGRAM



Attachment GP-EU1-I1
No. 4 Recovery Boiler
Process Flow Diagram

Process Flow Legend
Solid/Liquid →
Gas - - - →

Golder Associates

ATTACHMENT GP-EU1-I2

FUEL ANALYSIS OR SPECIFICATION

ATTACHMENT GP-EU1-I2

FUEL ANALYSIS
NO. 4 RECOVERY BOILER

Fuel	Density (lb/gal)	Moisture (%)	Weight % Sulfur	Weight % Ash	Heat Capacity
Black Liquor Solids	11.7	35	--	38%	5,850 Btu/lb
Natural Gas	--	--	--	--	1,000 Btu/scf

ATTACHMENT GP-EU1-I3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT

ATTACHMENT GP-EU1-I3

DETAILED DESCRIPTION OF CONTROL EQUIPMENT
NO. 4 RECOVERY BOILER

The No. 4 Recovery Boiler is equipped with an electrostatic precipitator for particulate matter control.

Manufacturer	Environmental Elements Corp.
Inlet Gas Temp (°F)	410
Gas Flowrate (acfm)	540,000
Primary Voltage (volts)	0-600
Secondary Voltage (kvolts-dc)	0-80
Primary Current (amps)	0-300
Secondary Current (amps)	0-1.500
Control Efficiency (%)	99.75

ATTACHMENT GP-EU1-I5

OPERATION AND MAINTENANCE PLAN

ATTACHMENT GP-EU1-I5

OPERATION AND MAINTENANCE PLAN
NO. 4 RECOVERY BOILER

OPERATIONS and MAINTENANCE

There are various Recovery Boiler operational events that could potentially lead to excess emissions. These events are caused by various malfunctions such as safety interlocks, process alarms, and equipment failures.

For typical and anticipated events, the Palatka Mill has determined the appropriate responses to correct malfunctions as soon as practicable. The mill employs trained maintenance workers who can repair mechanical and electrical problems. The mill also maintains supplies of spare parts deemed necessary to effect good, continuous operation.

During the period required to correct a malfunction while the process continues to operate, the Palatka Mill will limit emissions following practices designed to minimize emissions. Depending upon the scope of the malfunction, a complete process shutdown may be required.

PART B

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1.0 INTRODUCTION

Georgia-Pacific Consumer Operations LLC (GP) operates a Kraft pulp and paper mill located in Palatka, Putnam County, Florida. The processes and systems at the Palatka Mill include woodyard operations, pulp mill operations, chemical recovery processes, recausticizing processes, bleaching operations, utility operations, papermaking operations, and product converting systems. The Palatka Mill is currently operating under Title V Operating Permit No. 1070005-074-AV, issued by the Florida Department of Environmental Protection (FDEP) on January 17, 2013.

GP operates the No. 4 Recovery Boiler as part of the Mill's chemical recovery operations. The No. 4 Recovery Boiler is designed and permitted to burn black liquor solids (BLS) to utilize its inherent energy and recover inorganic chemicals from the spent cooking liquor. The No. 4 Recovery Boiler is also permitted to burn residual fuel oil as a startup, shutdown, and supplemental fuel. GP is proposing to implement the following changes in the No. 4 Recovery Boiler:

1. Replace the existing residual oil load burners with burners designed to burn natural gas alone
2. Replace the existing residual oil starter burners with natural gas starter burners
3. Replace the flame scanners on all burners with class 1 igniters with flame rods
4. Install new PLC-based burner management system (BMS) controls
5. Install fuel trains, piping and hardware to support the addition of natural gas as a permitted fuel

The GP Palatka Mill is an existing major source under the Prevention of Significant Deterioration (PSD) New Source Review (NSR) regulations. GP has performed a PSD applicability analysis for the burner replacement project using the "baseline actual-to-projected actual" emission comparison allowed under Rule 62-212.400(2)(a)1 of the Florida Administrative Code (F.A.C.). Based on this comparison, emission increases due to the project are predicted for some pollutants; however, all emission increases are less than the PSD significant emission rates. Therefore, the project will not trigger PSD new source review under federal and state air regulations.

A more detailed description of the proposed project is presented in Section 2.0. Preconstruction review requirements are discussed in Section 3.0, and air emission estimates and PSD applicability are presented in Section 4.0.

2.0 PROJECT DESCRIPTION

2.1 Existing Operations

The No. 4 Recovery Boiler at the Palatka Mill is currently limited to firing BLS, No. 6 (residual) fuel oil with a maximum sulfur content of 2.35 percent by weight, on-specification used oil, or a combination of these fuels. The No. 6 fuel oil may be fired for boiler startup, shutdown, and as a supplemental fuel. The steam that is produced in the boiler is used throughout the Mill. The No. 4 Recovery Boiler is permitted for the following operation:

Fuel	Maximum Heat Input Rate	Maximum Operating Rate
No. 6 fuel oil (24-hour rolling period)	423 MMBtu/hr	67,680 gallons total[1]
Black Liquor Solids (24-hour average)	1,345 MMBtu/hr	210,000 lb/hr [2]
No. 6 fuel oil (rolling 12-month total)	1,178,220 MMBtu	7,860,640 gallons[3]
On-Specification Used Oil	--	< 10% of fuel oil on an annual basis

[1] Based on a No. 6 fuel oil heating value of 150,000 British thermal units per gallon (Btu/gal).

[2] Equivalent to approx. 27,984 gal/hr black liquor based on a BLS heating value of 6,410 British thermal units per pound (Btu/lb)

[3] The annual oil fossil fuel firing limit represents an annual capacity factor of less than 10 percent of the maximum permitted annual heat input rate to the No. 4 Recovery Boiler. Includes on-spec used oil.

Particulate matter (PM) emissions from the No. 4 Recovery Boiler are controlled by an electrostatic precipitator (ESP) with automatic voltage control, 2-chambers, and 6 electric fields per chamber. Total reduced sulfur (TRS) emissions are controlled by the low-odor boiler design. Nitrogen oxide (NO_x) emissions are controlled by a four-level overfire air system. Carbon monoxide (CO) and volatile organic compound (VOC) emissions are controlled by the combustion design and good operating practices. Emissions of sulfur dioxide (SO_2), NO_x, CO, and TRS are monitored with continuous emissions monitoring systems (CEMS). Stack visible emissions are monitored with a continuous opacity monitoring system (COMS).

The emission limitations to which the No. 4 Recovery Boiler is subject are as follows:

- SO_2
  - 100 parts per million by dry volume (ppmvd) corrected to 8-percent oxygen (@ 8% O_2) as a 24-hour rolling average (excluding startup and shutdown) as determined by CEMS
  - 153.9 TPY during any consecutive 12 months (including all periods of startup, shutdown, malfunction, and oil firing) as determined by CEMS

- NO_x – 80 ppmvd @ 8% O_2 and 168.5 lb/hr based on a 30-day rolling CEMS average (excluding periods of startup and shutdown)
- CO – 400.0 ppmvd @ 8% O_2 and 512.7 lb/hr based on a 30-day rolling CEMS average (excluding periods of startup and shutdown)
- PM – 0.030 grains per dry standard cubic foot corrected to 8-percent oxygen (gr/dscf @ 8% O_2) and 75.6 pounds per hour (lb/hr)
- TRS – 34.2 tons per year (TPY) based on a 12-month rolling CEMS total
- VOC – 0.20 pounds per ton BLS (lb/ton BLS) and 21.0 lb/hr
- Sulfuric Acid Mist (SAM) – 0.81 ppmvd, 3.6 lb/hr, and 15.9 TPY
- Beryllium (Be) – 0.5 pound per trillion British thermal units (lb/10^{12} Btu), 6.4×10^{-4} lb/hr, and 2.8×10^{-3} TPY

2.2 Proposed Operations

GP is requesting authorization to install new burners and associated equipment that will allow it to burn natural gas in the No. 4 Recovery Boiler during startup (instead of fuel oil) and as a supplemental fuel. After the project, fuel oil will no longer be burned in the No. 4 Recovery Boiler.

The Mill intends to install natural gas startup burners, natural gas load burners, and a new burner management system. The total heat input to the No. 4 Recovery Boiler from natural gas combustion in the startup and load burners combined will be 664 MMBtu/hr. GP is proposing to limit the annual natural gas heat input to the current fuel oil limit of 1,178,220 MMBtu during any consecutive 12 months, which is equivalent to 10-percent of total permitted annual heat input of the boiler. In actual operation, the total annual heat input to the No. 4 Recovery Boiler due to fossil fuels has never been over approximately 5-percent, however additional natural gas (i.e., over and above what might otherwise be needed solely for startup/shutdown/supplementary purposes) may be burned in the No. 4 Recovery Boiler in the absence of the SO_2 restrictions that apply on fuel oil, and because the No. 4 Recovery Boiler has a greater efficiency compared to operating the No. 7 Package Boiler (EU 044). This possiblity is reflected in the PSD analysis.

The new gas burners and associated modifications are scheduled to be installed during an October 2013 annual outage. GP is targeting making the main piping modifications for natural gas and structural supports for the burner skids prior to the outage, as early as July 2013, depending on permit issuance or other FDEP approval. The following work will be performed on the boiler during the mill outage:

- Replacement of fuel oil starter burners with natural gas starter burners
- Replacement of fuel oil load burners with natural gas load burners
- Installation of the tie-ins to the natural gas pipeline (as well as the main piping if this was not performed earlier)
- Replacement of the fuel oil flame scanners with class 1 igniters with flame rods
- Installation of a natural gas header, piping, main gas meter modifications, and other associated equipment needed to supply the boiler with natural gas
- Installation and calibration of the burner management system

The conversion to natural gas as a startup and supplementary fuel for the No. 4 Recovery Boiler does not require an increase in permitted emission limits for the boiler. The conversion to natural gas may result in an increase in the utilization of gas in the No. 4 Recovery Boiler (i.e., over and above what might otherwise be needed solely for startup/shutdown/supplementary purposes), because the No. 4 Recovery Boiler may burn gas more efficiently than the No. 7 Package Boiler. Although this project may result in lower utilization of the No. 7 Package Boiler, this application is not taking credit for any reductions in emissions from the boiler. The project will have no effect on any other emission units at the Palatka Mill.

3.0 AIR QUALITY REVIEW REQUIREMENTS

3.1 PSD Review Requirements

The GP Palatka Mill is located in an area of Florida that is in attainment with the National Ambient Air Quality Standards (NAAQS) for all regulated pollutants. Therefore, the proposed project is being evaluated under the PSD provisions of the NSR permitting program. A PSD review is used to determine whether significant air quality deterioration will result from a new major facility or a major modification at an existing facility. The GP Mill is an existing major stationary source because the potential emissions of at least one PSD-regulated pollutant exceed 100 TPY (for example, potential NO_x emissions currently exceed 100 TPY). Therefore, PSD review is required for any pollutant for which the project causes both a significant increase in emissions and a significant net increase in emissions, with "significant" defined as being greater than the PSD significant emission rate (SER).

On January 2, 2011, greenhouse gas (GHG) emissions became subject to regulation under the Clean Air Act (CAA), triggering the need to evaluate GHG emissions under the PSD permitting program. The United States Environmental Protection Agency (U.S. EPA) is currently implementing GHG PSD permitting in the state of Florida, while FDEP maintains the permitting responsibility for all other regulated pollutants. Therefore, PSD permitting is addressed separately for GHGs and all other regulated pollutants in this section.

3.1.1 Florida DEP PSD Review Requirements for Non-Greenhouse Gas Emissions

Federal PSD requirements are contained in Title 40, Part 52.21 of the Code of Federal Regulations (40 CFR 52.21), Prevention of Significant Deterioration of Air Quality. The Florida Department of Environmental Protection (FDEP) has adopted PSD regulations that are equivalent to the federal PSD regulations (Rule 62-212.400, F.A.C.). For an existing major stationary source for which a modification is proposed, the modification is subject to PSD review if it causes two types of emissions increases – a significant emissions increase and a significant net emissions increase. In the first step, emissions increases from the project itself are computed and compared to the PSD SERs. If the increases are less than the SERs, then no further analysis is necessary and PSD permitting is not required. If the increases for the project itself exceed the SERs, then the second step involves additional analysis to determine if there will be a significant net emissions increase. The relevant PSD SERs are listed in Table 3-1.

The determination of whether a significant emissions increase will occur is based on a comparison of "baseline actual emissions" to "projected actual emissions" for all existing emission units affected by the proposed project. "Baseline actual emissions" and "projected actual emissions" are defined in Rules 62-210.200(36) and (245), F.A.C, respectively. "Baseline actual emissions" for an existing emissions unit, other than an electric utility steam generating unit, is the average rate, in TPY, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period, selected by the owner/operator, within the 10-year period immediately preceding the date a complete permit application is received by FDEP. The average rate includes fugitive emissions, to the extent quantifiable, and emissions associated with startups and shutdowns. The average rate must be adjusted downward to exclude:

- Any non-compliant emissions that occurred while the emissions units were operating above an emissions limitation that was legally enforceable during the consecutive 24-month period.
- Any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had such major stationary source been required to comply with such limitation during the consecutive 24-month period.

For projects involving multiple emissions units, only one consecutive 24-month period can be used for all the emissions units being modified. However, a different 24-month period can be used for each PSD pollutant.

Rule 62-210.370, F.A.C., establishes the methodology for computing baseline actual emissions and net emissions increases. In general, this rule sets forth a hierarchy of emission estimating methods, of which the most accurate method is to be used. Continuous emission monitoring systems (CEMS) are generally recognized as the most accurate method, followed by mass balance calculations, followed by emission factors. If stack test data are used, the emission factor must be based on the average emissions per unit of input, output, or gas volume, whichever is appropriate, of all valid tests conducted during at least a 5-year period encompassing the period over which the emissions are computed, provided that all stack tests used represent the same operational and physical configuration of the unit.

"Projected actual emissions" is the maximum annual rate, in TPY, at which an existing emissions unit is projected to emit a regulated air pollutant in any one of the 5 years following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's potential to emit that regulated air pollutant, and full utilization of the unit would result in a significant emissions increase or a significant net emissions increase at the facility.

In determining the projected actual emissions, the source must consider all relevant information, including historical operating data, the company's own representations, the company's expected business activity, the company's filings with the state or federal regulatory authorities, and compliance plans or orders. Fugitive emissions, to the extent quantifiable, and emissions associated with startups and shutdowns must be considered.

The projected actual emissions shall exclude that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions, and that are also unrelated to the particular project, including any increased utilization due to demand growth (this is referred to as the "demand growth exclusion"). The preamble to EPA's final PSD rule revisions, promulgated on December 31, 2002, states:

> *That is, under today's new provisions for non-routine physical or operational changes to existing emissions units, rather than basing a unit's post-change emissions on its PTE, you may project an annual rate, in TPY, that reflects the maximum annual emissions rate that will occur during any one of the 5 years immediately after the physical or operational change. ...This projection of the unit's annual emissions rate following the change is defined as the "projected actual emissions", and will be based on your maximum annual rate in tons per year at which you are projected to emit a regulated NSR pollutant, less any amount of emissions that could have been accommodated during the selected 24 month baseline period and is not related to the change. Accordingly, you will calculate the unit's projected actual emissions as the product of: (1) The hourly emissions rate, which is based on the operational capabilities following the change(s), taking into account legally enforceable restrictions that could affect the hourly emissions rate following the change(s); and (2) the projected level of utilization, which is based on both the emissions unit's historical annual utilization rate and available information regarding the emissions units' likely post-change capacity utilization. ...From the initial calculation, you may then make the appropriate adjustment to subtract out any portion of the emissions increase that could have been accommodated during the unit's 24-month baseline period and is unrelated to the change. [Federal Register, Vol. 67, pg. 80196]*
>
> *Consequently, under today's new rules, when a projected increase in equipment utilization is in response to a factor such as the growth in market demand, you may subtract the emission increases from the unit's projected actual emissions if: (1) The unit could have achieved the necessary level of utilization during the consecutive 24-month period you selected to establish the baseline actual emission; and (2) the increase is not related to the physical or operational change(s) made to the unit. [Federal Register, Vol. 67, pg. 80203]*

Further explanation was provided in the preamble to EPA's proposed PSD rule revisions on September 14, 2006:

> *That is, the source can emit up to its current maximum capacity without triggering major NSR under the actual-to-projected-actual test, as long as the increase is unrelated to the change. [Federal Register, Vol. 71, pg. 54237]*
>
> *Post-change emissions are generally projected using the emissions unit's maximum annual rate, in tons per year, at which it is expected to emit a regulated NSR pollutant within 5 years following a change, less any amount of emissions that the unit could have accommodated during the selected 24-month baseline period and that are unrelated to the change. This final "projected actual" value, in tons per year, is the value you compare to the "baseline actual emissions" to determine...whether the proposed project will result in a "significant" emissions increase, as defined in the first step of the calculation. [Federal Register, Vol. 71, pg. 54238]*

If the project results in a significant emissions increase for any PSD pollutant, then all contemporaneous increases or decreases in emissions of that pollutant that have occurred at the facility in the last 5 years must also be considered to determine if a significant net emissions increase has occurred.

A PSD applicability analysis was conducted to demonstrate that the proposed GP project would not trigger PSD review. The analysis is presented in Section 4.0.

3.1.2 U.S. EPA PSD Review Requirements for Greenhouse Gas Emissions

On December 15, 2009, EPA issued its GHG "endangerment finding" concluding that the combined emissions of six named GHGs from new motor vehicles endanger the public health and welfare, which allows the federal regulation of GHGs from new motor vehicles. EPA finalized those regulations [the "Light-Duty Vehicle Rule" (LDV Rule)] on April 1, 2010, in a joint rulemaking with the National Highway Traffic Safety Administration (NHTSA), making the collection of six GHGs "subject to regulation" under the CAA.[1]

On April 2, 2010, EPA finalized its reconsideration of the so-called Johnson memorandum, in which it decided to continue to interpret the term "subject to regulation" to include each pollutant subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant.[2] As a result of this interpretation, GHGs became subject to CAA permitting requirements under the PSD program on January 2, 2011, which was the date the first control requirements in the LDV Rule took effect for GHGs.

In an attempt to reduce the permitting burden associated with triggering NSR and Title V for GHGs, EPA finalized the PSD Tailoring Rule on June 3, 2010, to limit applicability of CAA requirements to large stationary sources of GHG emissions.[3] In the final rule, EPA created multiple steps, the first (Step 1) of which began January 2, 2011 (when the LDV Rule took effect) and ended on June 30, 2011, and applied to "anyway sources" and "anyway modifications" that would be subject to PSD "anyway", based on emissions of pollutants other than GHGs.

Step 2 of the PSD Tailoring Rule began July 1, 2011, and requires that GHG emissions associated with each project be evaluated for PSD applicability regardless of the level of criteria pollutant emission rate increases. The GP Palatka Mill must analyze GHG emissions under Step 2.- In both Step 1 and Step 2 of the Tailoring Rule, PSD permitting for GHGs is triggered if both the following occur due to a proposed modification at an existing major PSD source:

- GHG emission increases are 75,000 TPY of carbon dioxide equivalents (CO_2e) or more
- Total mass-based GHG emission increases are greater than zero

[1] 75 FR 25324 (May 7, 2010).
[2] 75 FR 17004 (April 2, 2010).
[3] 75 FR 31514 (June 3, 2010).

On July 20, 2011, the EPA deferred reporting of CO_2 emissions from bioenergy and other biogenic sources under the PSD program for 3 years.[4] The FDEP has been delegated PSD review authority in Florida for all PSD pollutants with the exception of GHGs. Because Florida has not yet adopted EPA's PSD regulations related to GHG emissions, EPA retains PSD review authority for GHGs. EPA's authority is contained in a Federal Implementation Plan (FIP) that became effective on December 30, 2010. The FIP includes the EPA PSD regulations contained in 40 CFR 52.21, including the PSD applicability provisions, but applies only to GHGs.

A PSD applicability analysis for GHG was conducted to demonstrate that the proposed project would not trigger PSD review under the PSD Tailoring Rule. The analysis is presented in Section 4.0.

3.2 NSPS and NESHAPs Applicability

3.2.1 NSPS Subpart Db

The No. 4 Recovery Boiler is not currently subject to new source performance standards (NSPS) Subpart Db (40 CFR 60, Subpart Db) for industrial, commercial, or institutional steam generating units. Subpart Db regulates emissions of SO_2, NO_x, and PM.

An existing source can become subject to the NSPS if it is "modified" or "reconstructed." Modification under NSPS is any physical change or change in the method of operation that causes an increase in any pollutant regulated under the NSPS, on a maximum hourly basis. The addition of the natural gas burners represents a physical change to the No. 4 Recovery Boiler. However, the change will not cause an increase in emissions of any NSPS-regulated pollutant on a maximum hourly basis. Natural gas has lower emission factors for all three regulated pollutants compared to No. 6 fuel oil.

In order to determine hourly mass emission rates of NSPS pollutants for the No. 4 Recovery Boiler prior to the proposed change, the permitted emission rate, heat input rate, and emission factor for the worst-case fuel type was used. To determine hourly mass emission rates of NSPS pollutants for the boiler after the proposed change, the burning of natural gas was considered along with the other fuels, with the worst-case hourly emissions determined. As shown in Table 3-2, the burning of natural gas will not result in increases in hourly emissions of SO_2, NO_x, and PM.

Reconstruction under NSPS is the replacement of components of an existing facility such that the fixed capital cost of the new components is greater than 50 percent of the fixed capital cost of constructing a new emissions unit. The cost of the proposed component replacements to No. 4 Recovery Boiler will be minimal compared to the cost of constructing a new recovery boiler. Therefore, the cost of the proposed

[4] 76 FR 43490 (July 20, 2011).

replacements are less than 50 percent of the cost of replacing the No. 4 Recovery Boiler, and the project will not constitute "reconstruction."

Based on the above analysis, the No. 4 Recovery Boiler will not be subject to the NSPS Subpart Db due to the proposed project.

3.2.2 NSPS Subpart BB

The No. 4 Recovery Boiler is not currently subject to NSPS Subpart BB for Kraft Pulp Mills. Subpart BB regulates emissions of PM and TRS.

Applying the same "modification" test as described above in section 3.2.1, the replacement of fuel oil burners with natural gas burners represents a physical change to the No. 4 Recovery Boiler. However, the change will not cause an increase in emissions of either PM or TRS on a maximum hourly basis. Natural gas has lower emissions for both regulated pollutants when compared to No. 6 fuel oil.

In order to determine hourly mass emission rates of PM and TRS for the No. 4 Recovery Boiler prior to the proposed change, the permitted emission rate, heat input rate, and emission factor for the worst-case fuel type was used. To determine hourly mass emission rates of PM and TRS for the boiler after the proposed change, the burning of natural gas was considered along with the other fuels, with the worst-case hourly emissions determined. As shown in Table 3-2, the burning of natural gas will not result in increases in maximum hourly emissions of PM and TRS.

Using the same "reconstruction" test as described above in section 3.2.1, the cost of the proposed component replacements to No. 4 Recovery Boiler will be minimal compared to the cost of constructing a new recovery boiler. Therefore, the cost of the proposed replacements is less than 50 percent of the cost of replacing the No. 4 Recovery Boiler, and the project will not constitute "reconstruction."

Based on the above analysis, the No. 4 Recovery Boiler will not be subject to the NSPS Subpart BB due to the proposed project.

3.2.3 NESHAP Subpart MM

The No. 4 Recovery Boiler is currently considered part of an existing affected source under National Emission Standards for Hazardous Air Pollutants (NESHAPS) Subpart MM (40 CFR 63, Subpart MM) for chemical recovery combustion sources at kraft, soda, sulfite, and stand-alone semi-chemical pulp mills. Subpart MM regulates emissions of organic and metal hazardous air pollutants (HAPs). An existing source can be considered a new source under the NESHAP if it is determined to have gone through "reconstruction" as defined under 40 CFR 63.2, which applies a 50% cost threshold for new components as compared to the fixed capital cost of a comparable new source. Under NESHAP MM, the affected source is the "chemical recovery system" as defined under 40 CFR 63.861 as "all existing DCE and

NDCE recovery furnaces, smelt dissolving tanks, and lime kilns at a Kraft or soda pulp mill." Therefore, when comparing the cost of the proposed project to the reconstruction threshold, the cost of a "comparable new source" for the Palatka Mill includes one recovery boiler, two smelt dissolving tanks, and one lime kiln. The cost of the proposed component replacements to No. 4 Recovery Boiler will be minimal compared to the cost of constructing a chemical recovery system and will not exceed the 50% modification threshold under the NESHAP. As a result, the No. 4 Recovery Boiler will not be reconstructed under the NESHAP definition and the unit will continue to be an existing source under 40 CFR 63, Subpart MM.

4.0 PSD ANALYSIS

4.1 Baseline Actual Emissions

The methodology used to determine baseline actual emissions for the No. 4 Recovery Boiler and the results of the determination are presented in this section. Based on Florida's PSD rules, the baseline actual emissions may be based on any consecutive 24-month period out of the last 10 years prior to submitting a complete application. Actual emissions for each month within the most recent 10 year period (March 2003 – December 2012) were determined based on operating data, available stack test data, continuous emissions monitoring (CEMs) data, and published emission factors. For each pollutant, the consecutive 24-month period with the highest average annual (TPY) emissions was selected as the baseline actual emissions for the No. 4 Recovery Boiler. The 24-month periods used for each pollutant are as follows:

Pollutant	24-Month Annual Average Baseline
Sulfur Dioxide – SO_2	December 2010 to November 2012
Nitrogen Oxides – NO_x	July 2005 to June 2007
Carbon Monoxide – CO	October 2006 to September 2008
Particulate Matter – PM	January 2005 to December 2006
Particulate Matter under 10 microns in diameter – PM_{10}	January 2005 to December 2006
Particulate Matter under 2.5 microns in diameter – $PM_{2.5}$	January 2005 to December 2006
Volatile Organic Compounds – VOCs	December 2006 to November 2008
Sulfuric Acid Mist – SAM	October 2010 to September 2012
Total Reduced Sulfur – TRS	January 2005 to December 2006
Lead – Pb	February 2008 to January 2010
Mercury – Hg	October 2006 to September 2008
Greenhouse Gases – GHGs	June 2008 to May 2010

The baseline actual emissions for the No. 4 Recovery Boiler may differ from the annual emissions shown in the Annual Operating Reports (AORs) submitted to FDEP by GP, as described below.

The emission factors used for determining the baseline actual emissions are shown in Table 4-1. The Florida rules require that if stack test data are used, the emission factor must be based on the average emissions per unit of input, output, or gas volume, whichever is appropriate, of all valid tests conducted during at least a 5-year period encompassing the period over which the emissions are computed, provided all stack tests used represent the same operational and physical configuration of the unit. To determine the operational and physical configuration of the No. 4 Recovery Boiler for each month during the past 10 years, the permitting files were researched. The No. 4 Recovery Boiler underwent a rebuild in 2007, authorized under Permit No. 1070005-038-AC/PSD-FL-380, that included extensive tube replacements and added a fourth level of combustion air in the boiler. Due to the physical changes to the combustion chamber of the boiler, the Palatka Mill determined that it was not appropriate to average stack test results performed before and after completion of the project. Therefore, the results of stack tack tests performed in 2006 and earlier were averaged separately from stack tests performed in 2007 and later. Stack test data for the No. 4 Recovery Boiler used to determine baseline actual emissions for SO_2, NO_x, CO, PM, VOC, SAM, and TRS are presented in Table 4-2. CEMS data were used to determine baseline actual emissions for the years 2008 through 2012 for SO_2, NO_x, CO, and TRS and are presented in Table 4-3. Monthly fuel usage data are presented in Table 4-4.

The resulting baseline actual emissions for each pollutant for each year, based on the revised emission factors, are presented in Tables 4-5 through 4-8. The highest 24-month annual average for each pollutant represents the baseline actual emissions (see Table 4-8). The following sections describe in more detail the development of the baseline actual emission factors for each PSD pollutant. Emission factor references are provided in Appendix A.

4.1.1 Sulfur Dioxide – SO_2

BLS – Baseline actual SO_2 emissions were calculated based on annual SO_2 compliance test data (see Table 4-2) and CEMS data (Table 4-3). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the average emission factors for 2003 through 2006, the stack test results from 2002 through 2006 were examined (see Table 4-2). The stack test in 2002 was determined to have been a high outlier as compared to other years in that timeframe. As a result, the tests from 2003 through 2006 were averaged and the resulting emission factor was used for each month from March 2003 through December 2006. The stack test in 2007 was used as the emission factor for each month from January 2007 through December 2007.

CEMS data became available for SO_2 emissions from the No. 4 Recovery Boiler in January 2008 (see Table 4-3). The average monthly SO_2 emission rate in lb/MMBtu, was used as the emission factor for each month from January 2008 through December 2012.

No. 6 Fuel Oil – Baseline actual SO_2 emissions from No. 6 fuel oil combustion were calculated from an emission factor of 164(S) pounds per thousand gallons (lb/10^3 gal) from Permit No. 1070005-074-AV for fuel oil burned during startup. This emission factor is for emissions for fuel oil combustion during startup of the No. 4 Recovery Boiler when black liquor solids are not being burned. SO_2 emissions from fuel oil combustion are almost completely controlled and passed along to the smelt when black liquor solids are being burned. This emission factor was used for startup fuel oil usage from March 2003 – December 2012.

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly SO_2 emissions were calculated (see Table 4-5). The running 12-month total SO_2 emissions were then calculated (see Table 4-6). The 24-month annual average SO_2 emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.2 Nitrogen Oxides – NO_x

BLS – Baseline actual NO_x emissions were calculated based on annual NO_x compliance test data (see Table 4-2) and CEMs data (Table 4-3). To determine the emission factors for 2003 through 2006, the stack tests performed from 2001 through 2006 were averaged and the resulting emission factor was used for each month from March 2003 through December 2006. The average of the stack tests from 2007 and 2008 was used as the emission factor for each month from January 2007 through December 2007.

CEMS data became available for NO_x emissions from the No. 4 Recovery Boiler in April 2008 (see Table 4-3). The average monthly NO_x emission rate in lb/MMBtu, was used as the emission factor for each month from April 2008 through December 2012. The weighted average of CEMS data from April through December 2008 was used as the emission factor for January, February, and March 2008.

No. 6 Fuel Oil – Baseline actual NO_x emissions from No. 6 fuel oil combustion were calculated from an emission factor of 47 lb/10^3 gal from AP-42, Table 1.3-1. This emission factor was used for all months from March 2003 through December 2007. The NO_x emissions from fuel oil combustion are accounted for in the CEMS data from January 2008 through December 2012.

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly NO_x emissions were calculated (see Table 4-5). The running 12-month total NO_x emissions were then calculated (see Table 4-6). The 24-month annual average NO_x emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.3 Carbon Monoxide – CO

BLS – Baseline actual CO emissions were calculated based on annual CO compliance test data (see Table 4-2) and CEMs data (Table 4-3). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the emission factors for 2003 through 2006, the average of the stack tests from 2001 through 2006 were used. This emission factor was used for each month from March 2003 through December 2006. The average of the stack tests from 2007 and 2008 was used as the emission factor for each month from January 2007 through December 2007.

CEMS data became available for CO emissions from the No. 4 Recovery Boiler in April 2008 (see Table 4-3). The average monthly CO emission rate in lb/MMBtu, was used as the emission factor for each month from April 2008 through December 2012. The weighted average of CEMS data from April through December 2008 was used as the emission factor for January, February, and March 2008.

No. 6 Fuel Oil – Baseline actual CO emissions from No. 6 fuel oil combustion were calculated from an emission factor of 5 lb/10^3 gal from AP-42, Table 1.3-1. This emission factor was used for all months from March 2003 through December 2007. The CO emissions from fuel oil combustion are accounted for in the CEMS data from January 2008 through December 2012.

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly CO emissions were calculated (see Table 4-5). The running 12-month total CO emissions were then calculated (see Table 4-6). The 24-month annual average CO emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.4 *Particulate Matter – Filterable PM/PM_{10}/$PM_{2.5}$ & Condensable PM_{10}/$PM_{2.5}$*

BLS –

Filterable PM/PM_{10}/$PM_{2.5}$ – Baseline actual filterable PM emissions were calculated based on annual PM compliance test data (see Table 4-2). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the emission factor for 2003 through 2006, the stack test results from 2001 through 2006 were averaged. This emission factor was used for the months of March 2003 through December 2006. The average of stack tests from 2007 through 2012 was used as the emission factor for the months of January 2007 through December 2012.

PM_{10} and $PM_{2.5}$ emission factors were based on 71.3 percent and 49.8 percent of PM emissions, respectively, from NCASI Technical Bulletin No. 884, Table 4.12, median values (see Table 4-1).

Condensable PM_{10}/$PM_{2.5}$ – Baseline actual condensable PM_{10} and $PM_{2.5}$ emissions were calculated from an emission factor of 0.063 lb/ton BLS from NCASI Technical Bulletin No. 884, Table 4.12, median values (see Table 4-1).

No. 6 Fuel Oil –

Filterable PM/PM_{10}/$PM_{2.5}$ – Baseline actual filterable PM emissions were calculated from AP-42, Table 1.3-4 for boilers with ESP control (see Table 4-1). The emission factors are as follows:

- PM: 0.067(1.12(S)+0.37) lb/10^3 gallons, where S is the sulfur content by weight
- PM_{10}: 63 percent of PM emissions
- $PM_{2.5}$: 41 percent of PM emissions

Condensable $PM_{10}/PM_{2.5}$ – Baseline actual condensable PM_{10} and $PM_{2.5}$ emissions were calculated from an emission factor of 1.5 lb/10^3 gallons from AP-42, Table 1.3-2 (see Table 4-1).

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly $PM/PM_{10}/PM_{2.5}$ emissions were calculated (see Table 4-5). The running 12-month total $PM/PM_{10}/PM_{2.5}$ emissions were then calculated (see Table 4-6). The 24-month annual average $PM/PM_{10}/PM_{2.5}$ emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.5 Volatile Organic Compounds – VOC

BLS – Baseline actual VOC emissions were calculated based on annual VOC compliance test data (see Table 4-2). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the emission factor for 2003 through 2006, the stack test results from 2001 through 2006 were averaged. This emission factor was used for the months of March 2003 through December 2006. The average of stack tests from 2007 through 2012 was used as the emission factor for the months of January 2007 through December 2012.

No. 6 Fuel Oil – Baseline actual VOC emissions were calculated based on an emission factor of 0.28 lb/10^3 gallons from AP-42, Table 1.3-3 for non-methane total organic compounds (see Table 4-1).

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly VOC emissions were calculated (see Table 4-5). The running 12-month total VOC emissions were then calculated (see Table 4-6). The 24-month annual average VOC emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.6 Sulfuric Acid Mist – SAM

BLS – Baseline actual SAM emissions were calculated based on annual SAM compliance test data (see Table 4-2). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the emission factor for 2003 through 2006, the stack test results from 2001 through 2006 were averaged. This emission factor was used for the months of March 2003 through December 2006. The average of stack tests from 2007 through 2012 was used as the emission factor for the months of January 2007 through December 2012. It is noted that the stack test results from 2005 through 2012 have all resulted in emissions that were below the detection limit of the test, therefore the result was reported at the test's detection limit for conservatism.

No. 6 Fuel Oil – Emissions of SAM from fuel oil combustion are typically based on the emissions of SO_2. Emissions of SO_2 from fuel oil combustion while also burning black liquor solids are essentially zero, as the SO_2 is passed into the smelt. Emissions of SAM from fuel oil combustion during startup when black liquor solids are not being burned are calculated from an emission factor of 5.7(S) lb/10^3 gal from AP-42, Table 1.3-1 for SO_3 emissions, where S is the sulfur content. The emission factor is divided by the emission factor for SO_2 (157[S] lb/10^3 gal), and then multiplied by the ratio of the molecular weights of SAM (H_2SO_4) and SO_3 (98/80). This calculation results in an emission factor where SAM emissions are approximately 4.45-percent of SO_2 emissions. This emission factor was used for all years.

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly SAM emissions were calculated (see Table 4-5). The running 12-month total SAM emissions were then calculated (see Table 4-6). The 24-month annual average SAM emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.7 Total Reduced Sulfur – TRS

BLS – Baseline actual TRS emissions were calculated based on annual TRS compliance test data (see Table 4-2) and CEMs data (Table 4-3). The compliance test averages, in lb/ton BLS, were determined for each year. To determine the emission factor for 2003 through 2006, the average of the stack tests from 2001 through 2006 were used. This emission factor was used for each month from March 2003 through December 2006. The stack test from 2007 was used as the emission factor for each month from January 2007 through December 2007.

CEMS data became available for TRS emissions from the No. 4 Recovery Boiler in April 2008 (see Table 4-3). The average monthly TRS emission rate in lb/MMBtu, was used as the emission factor for each month from April 2008 through December 2012. The weighted average of CEMS data from April through December 2008 was used as the emission factor for January, February, and March 2008.

No. 6 Fuel Oil – No emission factor exists for TRS emissions from fuel oil combustion, therefore no TRS emissions from combustion of No. 6 fuel oil were estimated.

Total Emissions – Using the BLS burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly TRS emissions were calculated (see Table 4-5). The running 12-month total TRS emissions were then calculated (see Table 4-6). The 24-month annual average TRS emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.8 Lead – Pb

BLS – Baseline actual Pb emissions were calculated from an emission factor of 9.81×10^{-6} lb/ton BLS from NCASI Technical Bulletin No. 973, Table 4-24, median values (see Table 4-1).

No. 6 Fuel Oil – Baseline actual Pb emissions were calculated from an emission factor of 0.00151 lb/10^3 gal from AP-42, Table 1.3-11 (see Table 4-1).

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly Pb emissions were calculated (see Table 4-5). The running 12-month total Pb emissions were then calculated (see Table 4-6). The 24-month annual average Pb emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.9 Mercury – Hg

BLS – Baseline actual Hg emissions were calculated from an emission factor of 3.38×10^{-6} lb/ton BLS from NCASI Technical Bulletin No. 973, Table 4.24, median values (see Table 4-1).

No. 6 Fuel Oil – Baseline actual Hg emissions were calculated from an emission factor of 0.000113 lb/10^3 gal from AP-42, Table 1.3-11 (see Table 4-1).

Total Emissions – Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly Hg emissions were calculated (see Table 4-5). The running 12-month total Hg emissions were then calculated (see Table 4-6). The 24-month annual average Hg emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.1.10 Fluorides – F

Although emission factors exist for fluoride emissions from No. 6 fuel oil combustion, no emission factors exist for BLS or natural gas firing. Fuel oil will not be burned in the No. 4 Recovery Boiler as a result of this project, therefore fluoride emissions were not estimated as part of this application.

4.1.11 Greenhouse Gases

Baseline actual GHG emissions for BLS and No. 6 fuel oil combustion were calculated from emission factors published in EPA's Mandatory GHG Reporting Rule. The emission factors for BLS combustion were obtained from the pulp and paper manufacturing subpart (40 CFR 98 Subpart AA, Table A-1), while the emission factors for No. 6 fuel oil combustion were obtained from the general stationary fuel combustion sources subpart (40 CFR 98 Subpart C, Tables C-1 and C-2). These emission factors are as follows:

- BLS
  - Carbon Dioxide (CO_2) – 94.4 kilograms per million British thermal units (kg/MMBtu; equivalent to 2,414 lb/ton BLS)
  - Methane (CH_4) – 0.03 kg/MMBtu (equivalent to 0.77 lb/ton BLS)

- Nitrous Oxide (N_2O) – 0.005 kg/MMBtu (equivalent to 0.13 lb/ton BLS)
- No. 6 Fuel Oil
  - CO_2 – 75.1 kg/MMBtu (equivalent to 24,835 lb/10^3 gal)
  - CH_4 – 0.003 kg/MMBtu (equivalent to 0.99 lb/10^3 gal)
  - N_2O – 0.0006 kg/MMBtu (equivalent to 0.20 lb/10^3 gal)

The emission factors in kg/MMBtu were multiplied by the conversion of 2.20462 pounds per kilogram (lb/kg) and the fuel heat content (No. 6 fuel oil – 150,000 British thermal units per gallon [Btu/gal]; BLS – 5,768 British thermal units per pound [Btu/lb]; see Table 4-1) to obtain emission factors in terms of lb/ton of BLS and lb/10^3 gallon of NO. 6 fuel oil.

Using the fuel burning rates in the No. 4 Recovery Boiler for each month (see Table 4-4) and the emission factors described above, the monthly GHG emissions were calculated (see Table 4-5). The running 12-month total GHG emissions were then calculated (see Table 4-6). The 24-month annual average GHG emissions were then calculated (see Table 4-7), and the highest 24-month average was selected as the baseline actual emissions (see Tables 4-7 and 4-8).

4.2 Projected Actual Emissions

"Projected actual emissions" for the No. 4 Recovery Boiler were developed based on all relevant information, including historical operating data, the company's own representations, and the company's expected business activity. The emission factors used to calculate the projected actual emissions due to BLS combustion were as follows (see Table 4-9):

- SO_2 – 0.0074 lb/MMBtu based on the maximum 12-month rolling average CEMS value (see Table 4-3)
- NO_x – 0.0936 lb/MMBtu based on the maximum 12-month rolling average CEMS value (see Table 4-3)
- CO – 0.2341 lb/MMBtu based on the maximum 12-month rolling average CEMS value (see Table 4-3)
- PM (filterable) – 0.203 lb/ton BLS based on the average stack test value from 2007 – 2012 plus 1 Standard Deviation.
- PM_{10}
  - Filterable – 71.3 percent of PM emissions from NCASI TB 884, Table 4.12, median value
  - Condensable – 0.063 lb/ton BLS from NCASI TB 884, Table 4.12, median value
- $PM_{2.5}$
  - Filterable – 49.8 percent of PM emissions from NCASI TB 884, Table 4.12, median value
  - Condensable – 0.063 lb/ton BLS from NCASI TB 884, Table 4.12, median value

- VOC – 0.077 lb/ton BLS based on the average stack test value from 2007 – 2012 plus 1 Standard Deviation.
- SAM – 0.003 lb/ton BLS based on the average stack test value from 2007 – 2012 plus 1 Standard Deviation.
- TRS – 0.0147 lb/ton BLS based on the maximum 12-month rolling average CEMS value (see Table 4-3)
- Pb, Hg, GHGs – The baseline emission factor was used to determine the projected actual emissions

The emission factors used to calculate the projected actual emissions due to natural gas combustion were as follows (see Table 4-10):

- SO_2
  - Natural Gas Firing Alone – 0.6 pounds per million cubic feet (lb/10^6 ft^3) from AP-42, Table 1.4-2
  - BLS/Natural Gas – 0.0074 lb/MMBtu from the maximum 12-month rolling average CEMS value (see Table 4-3)
- NO_x
  - Natural Gas Firing Alone – 0.15 lb/MMBtu based on vendor guarantee (equivalent to 150 lb/10^6 ft^3).
  - BLS/Natural Gas Co-firing – 0.0936 lb/MMBtu from the maximum 12-month rolling average CEMS value (see Table 4-3)
- CO
  - Natural Gas Firing Alone – 0.084 lb/MMBtu based on vendor guarantee (equivalent to 84 lb/10^6 ft^3).
  - BLS/Natural Gas Co-firing – 0.2341 lb/MMBtu from the maximum 12-month rolling average CEMS value (see Table 4-3)
- PM (filterable) – 1.9 lb/10^6 ft^3 from AP-42, Table 1.4-2
- PM_{10}/$PM_{2.5}$
  - Filterable – 1.9 lb/10^6 ft^3 from AP-42 from AP-42, Table 1.4-2
  - Condensable – 5.7 lb/10^6 ft^3 from AP-42 from AP-42, Table 1.4-2
- VOC – 5.5 lb/10^6 ft^3 from AP-42, Table 1.4-2
- SAM – 4.45 percent of SO_2 emissions (similar to fuel oil)
- TRS – None; no emission factors exist for TRS emissions from natural gas combustion
- Pb – 0.0005 lb/10^6 ft^3 from AP-42, Table 1.4-2
- Hg – 0.00026 lb/10^6 ft^3 from AP-42, Table 1.4-4
- F – No emission factor exists for fluoride emissions from natural gas combustion
- GHGs – from the mandatory GHG reporting rule (40 CFR Part 98, Tables C-1 and C-2)
  - CO_2 – 53.02 kg/MMBtu (equivalent to 116,889 lb/10^6 ft^3)
  - CH_4 – 0.001 kg/MMBtu (equivalent to 2.20 lb/10^6 ft^3)
  - N_2O – 0.0001 kg/MMBtu (equivalent to 0.22 lb/10^6 ft^3)

The projected actual activity factor was determined using the mill's projections for future production and the actual heat input to the boiler over the last 10 years. The GP Palatka Mill has determined that the No. 4 Recovery Boiler will burn a maximum of 823,000 TPY BLS over the next five years, which is equivalent to 9,629,100 MMBtu/yr of heat input, based on a BLS heat content of 5,850 Btu/lb.

The projected actual activity factor for auxiliary fuel combustion (natural gas) in the No. 4 Recovery Boiler is based on the current permit limit of no more than 10-percent of the No. 4 Recovery Boiler's potential annual heat input rate from fossil fuels. The maximum permitted heat input rate to the boiler is 1,345 MMBtu/hr, so the maximum heat input rate due to fossil fuels is 1,178,220 MMBtu/yr (see Table 4-10).

The total projected actual annual emissions were then summarized in Table 4-11.

4.3 Effects on Other Emissions Units

The proposed project will replace No. 6 fuel oil in the No. 4 Recovery Boiler with natural gas. The No. 4 Recovery Boiler may experience an increase in utilization as a result of burning natural gas and the difference in efficiencies between the No. 4 Recovery Boiler and the No. 7 Package Boiler. The overall annual steam production at the mill is not expected to increase as a result of the project; therefore the proposed project will have no effect on any other emissions units at the mill.

4.4 PSD Review

To complete the PSD applicability analysis, baseline actual emissions are subtracted from projected actual emissions and the resulting emission increases are compared to the PSD significant emission rates (SER). As demonstrated in Table 4-12, all emission increases are less than the PSD SER; therefore, it is not necessary to exclude that portion of the projected actual emissions that the unit "could have accommodated" during the 24-month baseline period and is unrelated to the proposed project.

TABLES

Table 3-1: PSD Significant Emission Rates and *de Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration[a] ($\mu g/m^3$)
Sulfur Dioxide (SO_2)	NAAQS, NSPS	40	13, 24-hour
Total Particulate Matter (PM)	NSPS	25	10, 24-hour
Particulate Matter <10 microns (PM_{10})	NAAQS	15	10, 24-hour
Fine Particulate Matter ($PM_{2.5}$)	NAAQS	10; or 40 SO_2 or NO_x	2.3, 24-hour [b]
Nitrogen Oxides (NO_X)	NAAQS, NSPS	40	14, annual
Carbon Monoxide (CO)	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (VOC)	NAAQS, NSPS	40	100 TPY [c]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist (SAM)	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Greenhouse Gases- Mass Basis, and	--	0, and	NM
- CO_2e Basis	--	75,000	NM

[a] Short-term concentrations are not to be exceeded.

[b] Proposed (Option 3 of three significant monitoring concentrations proposed), Federal Register, September 21, 2007.

[c] No *de minimis* concentration; an increase in VOC or NO_x emissions of 100 TPY or more will require monitoring analysis for ozone.

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below the de minimis monitoring concentrations.

CO_2e= Carbon dioxide equivalents

NAAQS = National Ambient Air Quality Standards

NESHAP = National Emission Standards for Hazardous Air Pollutants

NM = no ambient measurement method established, therefore no *de minimis* concentration has been established.

NSPS = New Source Performance Standards

Source: 40 CFR 52.21

Table 3-2: Change In Potential Hourly Emission Rates of NSPS Regulated Pollutants, No. 4 Recovery Boiler

	Emissions before the Change			Emissions after the Change			Increase in Hourly Emissions (lb/hr)
Pollutant / Fuel	Emission Factor	Activity Factor	Hourly Emissions (lb/hr)	Emission Factor	Activity Factor	Hourly Emissions (lb/hr)	
Sulfur Dioxide - SO_2							
-- *Black Liquor Solids* [a]	-- --	-- --	292.80	-- --	-- --	292.80	
-- *No. 6 Fuel Oil during Startup* [b]	164(S) lb/10^3 gal	2,820 gal/hr	1,086.83	-- --	-- --	--	
	2.35 % Sulfur	-- --		-- --	-- --		
-- *Natural Gas during Startup* [b]	-- --	-- --	--	0.6 lb/10^6 ft^3	664 MMBtu/hr	0.40	
-- Maximum			**1,086.83**			**292.80**	**-794.03**
Nitrogen Oxides - NO_x							
-- *Black Liquor Solids* [a]	-- --	-- --	168.50	-- --	-- --	168.50	
-- *No. 6 Fuel Oil during Startup* [b]	47 lb/10^3 gal	2,820 gal/hr	132.54	-- --	-- --	--	
-- *Natural Gas during Startup* [b]	-- --	-- --	--	150 lb/10^6 ft^3	664 MMBtu/hr	99.60	
-- Maximum			**168.50**			**168.50**	**0.00**
Particulate Matter Total - PM (filterable)							
-- *Black Liquor Solids* [a]	-- --	-- --	75.60	-- --	-- --	75.60	
-- *No. 6 Fuel Oil during Startup* [b]	0.067(1.12(S)+0.37) lb/10^3 gal	2,820 gal/hr	0.57	-- --	-- --	--	
-- *Natural Gas during Startup* [b]	-- --	-- --	--	1.9 lb/10^6 ft^3	664 MMBtu/hr	1.26	
-- Maximum			**75.60**			**75.60**	**0.00**
Total Reduced Sulfur - TRS							
-- *Black Liquor Solids*	-- --	-- --	7.81	-- --	-- --	7.81	
-- *No. 6 Fuel Oil during Startup* [b]	-- --	-- --	--	-- --	-- --	--	
-- *Natural Gas during Startup* [b]	-- --	-- --	--	-- --	-- --	--	
-- Maximum			**7.81**			**7.81**	**0.00**

[a] Emission rates for black liquor solids firing based on permit limits: SO_2 - 100 ppmvd @ 8% O_2 as a 24-hour rolling average (equivalent to 292.8 lb/hr); NO_x - 80 ppmvd @ 8% O_2 as a 30-day rolling average (equivalent to 168.5 lb/hr); PM - 0.03 gr/dscf @ 8% O_2 (equivalent 75.6 lb/hr); TRS - 34.2 TPY as a 12-month rolling total (equivalent to 7.8 lb/hr based on an annual average and assuming 8,760 hr/yr operation).

[b] Emission factors for fossil fuel combustion found in Table 4-1 (fuel oil) and 4-10 (natural gas).

Table 4-1: Emission Factors Used to Determine Baseline Actual Annual Emissions (2002 - 2012), No. 4 Recovery Boiler

Month	Operating Hours	Sulfur Content (%)	Emission Factor Units	Pollutant Emission Factors																
				SO_2	NO_x	CO	PM	PM_{10} Filterable	PM_{10} Condensable	$PM_{2.5}$ Filterable	$PM_{2.5}$ Condensable	VOC	SAM	TRS	Lead	Mercury	Biogenic CO_2	Non-Biogenic CO_2	CH_4	N_2O
No. 4 Recovery Boiler (EU 018)																				
2003 Actual Emission Factors	8,283																			
- Black Liquor Solids		--	lb/ton BLS	0.0530 [A]	1.129 [A]	2.693 [A]	0.252 [A]	0.180 [B]	0.063 [B]	0.125 [B]	0.063 [B]	0.041 [A]	0.004 [A]	0.021 [A]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		2.18	lb/10^3 gal	357.52 [F]	47 [G]	5 [G]	0.188 [H]	0.119 [H]	1.5 [I]	0.077 [H]	1.5 [I]	0.28 [J]	15.90 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2004 Actual Emission Factors	8,377																			
- Black Liquor Solids		--	lb/ton BLS	0.0530 [A]	1.129 [A]	2.693 [A]	0.252 [A]	0.180 [B]	0.063 [B]	0.125 [B]	0.063 [B]	0.041 [A]	0.004 [A]	0.021 [A]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		2.17	lb/10^3 gal	355.88 [F]	47 [G]	5 [G]	0.188 [H]	0.118 [H]	1.5 [I]	0.077 [H]	1.5 [I]	0.28 [J]	15.83 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2005 Actual Emission Factors	8,166																			
- Black Liquor Solids		--	lb/ton BLS	0.0530 [A]	1.129 [A]	2.693 [A]	0.252 [A]	0.180 [B]	0.063 [B]	0.125 [B]	0.063 [B]	0.041 [A]	0.004 [A]	0.021 [A]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.59	lb/10^3 gal	260.76 [F]	47 [G]	5 [G]	0.144 [H]	0.091 [H]	1.5 [I]	0.059 [H]	1.5 [I]	0.28 [J]	11.60 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2006 Actual Emission Factors	8,412																			
- Black Liquor Solids		--	lb/ton BLS	0.0530 [A]	1.129 [A]	2.693 [A]	0.252 [A]	0.180 [B]	0.063 [B]	0.125 [B]	0.063 [B]	0.041 [A]	0.004 [A]	0.021 [A]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.61	lb/10^3 gal	264.04 [F]	47 [G]	5 [G]	0.146 [H]	0.092 [H]	1.5 [I]	0.060 [H]	1.5 [I]	0.28 [J]	11.74 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2007 Actual Emission Factors	8,341																			
- Black Liquor Solids		--	lb/ton BLS	0.0100 [A]	1.108 [A]	3.281 [A]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	0.010 [A]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.60	lb/10^3 gal	262.40 [F]	47 [G]	5 [G]	0.145 [H]	0.091 [H]	1.5 [I]	0.059 [H]	1.5 [I]	0.28 [J]	11.67 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2008 Actual Emission Factors	8,262																			
- Black Liquor Solids		--	lb/ton BLS	-- [N]	-- [N]	-- [N]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	-- [N]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.71	lb/10^3 gal	280.44 [F]	-- [N]	-- [N]	0.153 [H]	0.096 [H]	1.5 [I]	0.063 [H]	1.5 [I]	0.28 [J]	12.47 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2009 Actual Emission Factors	8,139																			
- Black Liquor Solids		--	lb/ton BLS	-- [N]	-- [N]	-- [N]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	-- [N]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.82	lb/10^3 gal	298.48 [F]	-- [N]	-- [N]	0.161 [H]	0.102 [H]	1.5 [I]	0.066 [H]	1.5 [I]	0.28 [J]	13.27 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2010 Actual Emission Factors	8,262																			
- Black Liquor Solids		--	lb/ton BLS	-- [N]	-- [N]	-- [N]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	-- [N]	9.81E-06 [D]	3.38E-06 [D]	2,414 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.71	lb/10^3 gal	280.44 [F]	-- [N]	-- [N]	0.153 [H]	0.096 [H]	1.5 [I]	0.063 [H]	1.5 [I]	0.28 [J]	12.47 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2011 Actual Emission Factors	8,139																			
- Black Liquor Solids		--	lb/ton BLS	-- [N]	-- [N]	-- [N]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	-- [N]	9.81E-06 [D]	3.38E-06 [D]	2,435 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.82	lb/10^3 gal	298.48 [F]	-- [N]	-- [N]	0.161 [H]	0.102 [H]	1.5 [I]	0.066 [H]	1.5 [I]	0.28 [J]	13.27 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]
2012 Actual Emission Factors	8,035																			
- Black Liquor Solids		--	lb/ton BLS	-- [N]	-- [N]	-- [N]	0.137 [A]	0.098 [B]	0.063 [B]	0.068 [B]	0.063 [B]	0.053 [A]	0.002 [A]	-- [N]	9.81E-06 [D]	3.38E-06 [D]	2,435 [E]	--	0.77 [E]	0.13 [E]
- No. 6 Fuel Oil		1.74	lb/10^3 gal	285.36 [F]	-- [N]	-- [N]	0.155 [H]	0.098 [H]	1.5 [I]	0.064 [H]	1.5 [I]	0.28 [J]	12.69 [K]	--	0.00151 [L]	0.000113 [L]	--	24,835 [M]	0.99 [M]	0.20 [M]

[A] Based on stack testing (see Table 4-2).

[B] NCASI Technical Bulletin No. 884, Table 4.12, median values. Filterable PM_{10} and $PM_{2.5}$ emission factors are 71.3-percent and 49.8-percent of filterable PM emissions, respectively.

[C] NCASI Technical Bulletin No. 973, Table 4.23, median values.

[D] NCASI Technical Bulletin No. 973, Table 4.24, median values.

[E] Greenhouse Gas Reporting Rule (40 CFR 98 Subpart AA - Pulp and Paper Manufacturing). Emission factors for North American softwood are 94.4 kg/MMBtu for CO_2, 0.030 kg/MMBtu for CH_4, and 0.005 kg/MMBtu for N_2O. BLS heat content is 5,800 Btu/lb based on mill records from 2008 - 2010, and 5,850 Btu/lb based on mill records from 2011 - 2012.

[F] SO_2 emission factor is 164(S) lb/10^3 gallons for fuel oil burned during startup. Emissions from fuel oil burned during normal operation are included in the stack test and CEMS data.

[G] AP-42, Table 1.3-1. Emission factors are for fuel oil burned during startup. Emissions from fuel oil burning during normal operaiton are included in the stack test and CEMS data.

[H] AP-42, Table 1.3-4, ESP control. PM emission factor is 0.067 * (1.12 * S + 0.37) lb/10^3 gal. PM_{10} emissions are 63% of PM emissions. $PM_{2.5}$ emissions are 41% of PM emissions.

[I] AP-42, Table 1.3-2.

[J] AP-42, Table 1.3-3, nonmethane total organic compounds for No. 6 fuel oil combustion in industrial boilers.

[K] Based on emission factor for SO_3 of 5.7(S) lb/10^3 gallons from AP-42, Table 1.3-1, where S is the sulfur content of the fuel oil. The ratio of SO_3 to SO_2 emissions (5.7/157) is multiplied by the ratio of molecular weights of SAM and SO_3 (98/80), resulting in a factor of approximately 4.45 percent of SO_2. Emissions are for fuel oil burned during startup.

[L] AP-42, Table 1.3-11.

[M] Greenhouse Gas Reporting Rule (40 CFR 98 Subpart C - General Stationary Fuel Combustion Sources). Emission factors for No. 6 Fuel Oil are 75.1 kg/MMBtu for CO_2, 0.003 kg/MMBtu for CH_4, and 0.0006 kg/MMBtu for N_2O. No. 6 Fuel Oil heat content is 150 MMBtu/10^3 gallons.

[N] Emissions based on monthly average CEMS data (see Table 4-3). NO_x emissions from fuel oil combustion captured in CEMS data.

Table 4-2. No. 4 Recovery Boiler Stack Test and Continuous Emission Monitoring System Data

	Stack Test Data			Baseline Actual Emission Factor Development		
Test Date	BLS Burning Rate (tph)	Emission Rate (lb/hr)	Emission Factor (lb/ton BLS)	Reporting Year	Averaging Period	Emission Factor [a] (lb/ton BLS)
			Sulfur Dioxide (SO_2) [b,c]			
07/01/02	97.9	67.5	0.689	2002	2003 - 2006	0.0530
01/17/03	97.9	1.5	0.015	2003	2003 - 2006	0.0530
03/02/04	97.7	4.3	0.044	2004	2003 - 2006	0.0530
09/06/05	93.8	0	0.000	2005	2003 - 2006	0.0530
07/24/06	96.5	14.6	0.151	2006	2003 - 2006	0.0530
09/12/07	96.2	1	0.010	2007	2007	0.0100
2008	--	CEMS	--	2008	See Table 4-3	--
2009	--	CEMS	--	2009	See Table 4-3	--
2010	--	CEMS	--	2010	See Table 4-3	--
2011	--	CEMS	--	2011	See Table 4-3	--
2012	--	CEMS	--	2012	See Table 4-3	--
			Nitrogen Oxides (NO_x) [c,d]			
07/11/01	93.8	105.1	1.120			
07/01/02	97.9	130.1	1.329	2002	2001 - 2006	1.129
01/17/03	97.9	93.3	0.953	2003	2001 - 2006	1.129
03/02/04	97.7	115	1.177	2004	2001 - 2006	1.129
09/06/05	93.8	116.3	1.240	2005	2001 - 2006	1.129
07/24/06	96.5	92.4	0.958	2006	2001 - 2006	1.129
09/12/07	96.2	121.3	1.261	2007	2007, 2008	1.108
2008	101.6	97	0.955	2008	See Table 4-3	--
2009	--	CEMS	--	2009	See Table 4-3	--
2010	--	CEMS	--	2010	See Table 4-3	--
2011	--	CEMS	--	2011	See Table 4-3	--
2012	--	CEMS	--	2012	See Table 4-3	--
			Carbon Monoxide (CO) [c,d]			
07/11/01	93.8	407.5	4.344			
07/01/02	97.9	166.6	1.702	2002	2001 - 2006	2.693
01/17/03	97.9	226	2.308	2003	2001 - 2006	2.693
03/02/04	97.7	318	3.255	2004	2001 - 2006	2.693
09/06/05	93.8	293	3.124	2005	2001 - 2006	2.693
07/24/06	96.5	137.4	1.424	2006	2001 - 2006	2.693
09/12/07	96.2	440	4.574	2007	2007, 2008	3.281
2008	101.6	202	1.988	2008	See Table 4-3	--
2009	--	CEMS	--	2009	See Table 4-3	--
2010	--	CEMS	--	2010	See Table 4-3	--
2011	--	CEMS	--	2011	See Table 4-3	--
2012	--	CEMS	--	2012	See Table 4-3	--
			Particulate Matter (PM) (Filterable Only) [c,d]			
07/11/01	93.8	37.8	0.403			
07/01/02	97.9	19.3	0.197	2002	2001 - 2006	0.252
01/17/03	97.9	15.4	0.157	2003	2001 - 2006	0.252
08/26/04	96.5	31.2	0.323	2004	2001 - 2006	0.252
09/06/05	93.8	13.6	0.145	2005	2001 - 2006	0.252
07/24/06	96.5	27.6	0.286	2006	2001 - 2006	0.252
09/12/07	96.2	10.6	0.110	2007	2007 - 2012	0.137
2008	101.6	12.4	0.122	2008	2007 - 2012	0.137
03/18/09	101.0	12.3	0.122	2009	2007 - 2012	0.137
03/24/10	100.0	27.0	0.270	2010	2007 - 2012	0.137
04/26/11	98.7	8.3	0.084	2011	2007 - 2012	0.137
07/20/12	95.5	10.6	0.111	2012	2007 - 2012	0.137
		Average (2007 - 2012):	**0.137**			
		Standard Deviation (2007 - 2012):	**0.067**			
		Average + 1 Std Dev (2007 - 2012):	**0.203**			
			Volatile Organic Compounds (VOC) [c,d]			
03/29/96	96.0	0.03	0.0003	1996		
02/11/97	96.3	0.02	0.0002	1997		
03/03/98	95.7	2.2	0.0230	1998		
05/11/99	96.3	1.8	0.0187	1999		
04/11/00		0.7				
07/11/01	93.8	6.1	0.065			
07/01/02	97.9	8.2	0.083	2002	2001 - 2006	0.041
01/17/03	97.9	3.7	0.038	2003	2001 - 2006	0.041
03/02/04	97.7	0.3	0.003	2004	2001 - 2006	0.041
09/06/05	93.8	4.3	0.046	2005	2001 - 2006	0.041
07/24/06	96.5	1.0	0.010	2006	2001 - 2006	0.041
09/12/07	96.2	3.0	0.031	2007	2007 - 2012	0.053
2008	101.6	8.0	0.079	2008	2007 - 2012	0.053
03/18/09	101.0	3.5	0.035	2009	2007 - 2012	0.053
03/24/10	100.0	7.1	0.071	2010	2007 - 2012	0.053
04/26/11	98.7	7.3	0.074	2011	2007 - 2012	0.053
07/20/12	95.5	2.9	0.030	2012	2007 - 2012	0.053
		Average (2007 - 2012):	**0.053**			
		Standard Deviation (2007 - 2012):	**0.023**			
		Average + 1 Std Dev (2007 - 2012):	**0.077**			

Table 4-2. No. 4 Recovery Boiler Stack Test and Continuous Emission Monitoring System Data

	Stack Test Data			Baseline Actual Emission Factor Development		
Test Date	BLS Burning Rate (tph)	Emission Rate (lb/hr)	Emission Factor (lb/ton BLS)	Reporting Year	Averaging Period	Emission Factor [a] (lb/ton BLS)
			Sulfuric Acid Mist (SAM) [c,d]			
07/11/01	93.8	--	--			
07/01/02	97.9	0.8	0.0082	2002	2002 - 2006	0.004
01/17/03	97.9	0.3	0.0031	2003	2002 - 2006	0.004
03/02/04	97.7	0.6	0.0061	2004	2002 - 2006	0.004
9/7/2005 [e]	93.8	0.1	0.0011	2005	2002 - 2006	0.004
7/24/2006 [e]	96.5	0.1	0.0010	2006	2002 - 2006	0.004
9/14/2007 [e]	96.2	0.2	0.0021	2007	2007 - 2012	0.002
7/18/2008 [e]	101.6	0.2	0.0020	2008	2007 - 2012	0.002
3/18/2009 [e]	101.0	0.05	0.0005	2009	2007 - 2012	0.002
3/24/2010 [e]	100.0	0.2	0.0020	2010	2007 - 2012	0.002
4/26/2011 [e]	98.7	0.3	0.0030	2011	2007 - 2012	0.002
7/20/2012 [e]	95.5	0.1	0.0010	2012	2007 - 2012	0.002
		Average (2007 - 2012):	**0.0018**			
		Standard Deviation (2007 - 2012):	**0.0009**			
		Average + 1 Std Dev (2007 - 2012):	**0.0027**			
			Total Reduced Sulfur (TRS) [c,d]			
03/29/96	96.0	5.6	0.0583	1996		
02/11/97	96.3	0.6	0.0062	1997		
03/03/98	95.7	3.1	0.0324	1998		
05/11/99	96.3	1.3	0.0135	1999		
04/11/00		1.6				
07/11/01	93.8	2.9	0.031			
07/01/02	97.9	1.9	0.019	2002	2001 - 2006	0.021
01/17/03	97.9	0.6	0.007	2003	2001 - 2006	0.021
03/02/04	97.7	2.2	0.023	2004	2001 - 2006	0.021
09/06/05	93.8	3.3	0.035	2005	2001 - 2006	0.021
07/24/06	96.5	1.1	0.011	2006	2001 - 2006	0.021
09/12/07	96.2	1.0	0.010	2007	2007	0.010
2008	--	CEMS	--	2008	See Table 4-3	--
2009	--	CEMS	--	2009	See Table 4-3	--
2010	--	CEMS	--	2010	See Table 4-3	--
2011	--	CEMS	--	2011	See Table 4-3	--
2012	--	CEMS	--	2012	See Table 4-3	--

[a] As required by Florida Rule 62-210.370, when stack test data are used to determine baseline actual emissions, an average value including at least five years of test results is determined. For each pollutant, engineering judgment is used to determine the appropriate number of years to include in the averaging of stack test data. When CEMS are used to determine baseline actual emissions, no averaging is required and none is performed for this analysis.

[b] For SO_2, the stack test-based emission factors for 2002 was not used as it is not representative of the operation during that time. Tthe stack test result from 2005 was reported as zero (none detected). Therefore, the average emission factors 2003 - 2006 are calculated as the average of the stack tests from 2003 - 2006. The stack test from 2007 is used to calculate baseline actual emission factors for 2007, and CEMS data is used to calculate baseline actual emission factors for 2008 - 2012.

[c] No. 4 Recovery Boiler underwent a rebuild under Permit No. 1070005-038-AC/PSD-FL-380. As a result of this physical change, which was completed in 2007, stack test results prior to the September 12, 2007 stack test are not representative of the stack tests after this date.

[d] When available, the baseline actual emission factor for a given year is calculated as the average of the five years immediately surrounding the current year (i.e., average of the two years prior to the current year, the current year, and the two year after the current year). If data are not available for all years, engineering judgment is used to determine the appropriate five years to average to determine the baseline emission factor. In no instance is CEMS data averaged with stack test data to determine the baseline average emission factors.

[e] Stack test results were below detection limits. Emissions were set at the detection limit.

Table 4-3. No. 4 Recovery Boiler Continuous Emission Monitoring System Data

Month	CEMS Monthly Average				CEMS 12-Month Rolling Average			
	SO_2 (lb/MMBtu)	NO_x [a] (lb/MMBtu)	CO [a] (lb/MMBtu)	TRS (lb/ton BLS)	SO_2 (lb/MMBtu)	NO_x (lb/MMBtu)	CO (lb/MMBtu)	TRS (lb/ton BLS)
January 2008	0.0002	0.0897	0.2384	0.0256	--	--	--	--
February 2008	0.0030	0.0897	0.2384	0.0244	--	--	--	--
March 2008	0.0004	0.0897	0.2384	0.0253	--	--	--	--
April 2008	0.0007	0.0903	0.2513	0.0171	--	--	--	--
May 2008	0.0048	0.0820	0.2493	0.0125	--	--	--	--
June 2008	0.0034	0.0837	0.2089	0.0114	--	--	--	--
July 2008	0.0002	0.0821	0.3174	0.0134	--	--	--	--
August 2008	0.0035	0.0986	0.2806	0.0112	--	--	--	--
September 2008	0.0081	0.0911	0.2405	0.0082	--	--	--	--
October 2008	0.0079	0.0937	0.1990	0.0086	--	--	--	--
November 2008	0.0004	0.0976	0.2229	0.0072	--	--	--	--
December 2008	0.0079	0.0912	0.1243	0.0114	0.0034	0.090	0.234	0.0147
January 2009	0.0086	0.0994	0.1806	0.0172	0.0041	0.091	0.229	0.0140
February 2009	0.0279	0.0992	0.1414	0.0129	0.0062	0.092	0.221	0.0130
March 2009	0.0076	0.0941	0.1087	0.0113	0.0068	0.092	0.210	0.0119
April 2009	0.0007	0.0959	0.1775	0.0115	0.0068	0.092	0.204	0.0114
May 2009	0.0007	0.0816	0.0946	0.0092	0.0064	0.092	0.191	0.0111
June 2009	0.0147	0.0919	0.0935	0.0132	0.0074	0.093	0.182	0.0113
July 2009	0.0003	0.0805	0.1416	0.0110	0.0074	0.093	0.167	0.0111
August 2009	0.0031	0.0974	0.1283	0.0129	0.0073	0.093	0.154	0.0112
September 2009	0.0005	0.0848	0.1681	0.0101	0.0067	0.092	0.148	0.0114
October 2009	0.0005	0.0807	0.2183	0.0111	0.0061	0.091	0.150	0.0116
November 2009	0.0117	0.0989	0.2565	0.0169	0.0070	0.091	0.153	0.0124
December 2009	0.0035	0.0938	0.2065	0.0191	0.0066	0.092	0.160	0.0130
January 2010	0.0155	0.1025	0.2104	0.0215	0.0072	0.092	0.162	0.0134
February 2010	0.0021	0.1099	0.1387	0.0104	0.0051	0.093	0.162	0.0132
March 2010	0.0009	0.0913	0.1445	0.0124	0.0045	0.092	0.165	0.0133
April 2010	0.0009	0.0868	0.1816	0.0123	0.0045	0.092	0.165	0.0133
May 2010	0.0027	0.0997	0.1840	0.0119	0.0047	0.093	0.173	0.0136
June 2010	0.0007	0.0865	0.1617	0.0111	0.0035	0.093	0.178	0.0134
July 2010	0.0009	0.0906	0.1947	0.0121	0.0036	0.094	0.183	0.0135
August 2010	0.0007	0.0827	0.2266	0.0089	0.0034	0.092	0.191	0.0132
September 2010	0.0007	0.0830	0.1378	0.0079	0.0034	0.092	0.188	0.0130
October 2010	0.0032	0.0847	0.1082	0.0069	0.0036	0.093	0.179	0.0126
November 2010	0.0009	0.0851	0.1735	0.0066	0.0027	0.091	0.172	0.0118
December 2010	0.0075	0.1058	0.1375	0.0121	0.0031	0.092	0.167	0.0112
January 2011	0.0018	0.0898	0.1758	0.0103	0.0019	0.091	0.164	0.0102
February 2011	0.0019	0.1040	0.2474	0.0142	0.0019	0.091	0.173	0.0105
March 2011	0.0018	0.0862	0.1738	0.0138	0.0020	0.090	0.175	0.0107
April 2011	0.0018	0.0836	0.2529	0.0385	0.0020	0.090	0.181	0.0128
May 2011	0.0018	0.0952	0.1723	0.0151	0.0020	0.090	0.180	0.0131
June 2011	0.0018	0.0833	0.2160	0.0144	0.0021	0.089	0.185	0.0134
July 2011	0.0018	0.0823	0.1888	0.0022	0.0021	0.089	0.184	0.0126
August 2011	0.0018	0.0851	0.1796	0.0045	0.0022	0.089	0.180	0.0122
September 2011	0.0145	0.0762	0.1423	0.0110	0.0034	0.088	0.181	0.0125
October 2011	0.0383	0.0781	0.1464	0.0113	0.0063	0.088	0.184	0.0128
November 2011	0.0065	0.0947	0.1137	0.0118	0.0068	0.089	0.179	0.0133
December 2011	0.0018	0.0933	0.2207	0.0124	0.0063	0.088	0.186	0.0133
January 2012	0.0018	0.1001	0.1455	0.0076	0.0063	0.088	0.183	0.0131
February 2012	0.0011	0.0855	0.2040	0.0079	0.0062	0.087	0.180	0.0126
March 2012	0.0009	0.0867	0.1946	0.0077	0.0062	0.087	0.181	0.0121
April 2012	0.0006	0.0760	0.1213	0.0051	0.0061	0.086	0.170	0.0093
May 2012	0.0008	0.0915	0.1653	0.0064	0.0060	0.086	0.170	0.0085
June 2012	0.0004	0.0866	0.1008	0.0080	0.0059	0.086	0.160	0.0080
July 2012	0.0003	0.0803	0.0993	0.0068	0.0058	0.086	0.153	0.0084
August 2012	0.0009	0.0811	0.0818	0.0062	0.0057	0.086	0.145	0.0085
September 2012	0.0006	0.0827	0.0734	0.0075	0.0045	0.086	0.139	0.0082
October 2012	0.0012	0.0783	0.0723	0.0072	0.0014	0.086	0.133	0.0079
November 2012	0.0054	0.0793	0.0382	0.0051	0.0013	0.085	0.126	0.0073
December 2012	0.0024	0.0884	0.0632	0.0065	0.0014	0.085	0.113	0.0068
Minimum:	0.0002	0.0760	0.0382	0.0022	0.0013	0.0847	0.1133	0.0068
Average:	0.0042	0.0892	0.1719	0.0118	0.0046	0.0900	0.1734	0.0117
Maximum:	0.0383	0.1099	0.3174	0.0385	0.0074	0.0936	0.2341	0.0147

[a] January - March, 2008 values based on weighted average of the monthly averages from the rest of 2008.

Table 4-4: Annual Operating and Fuel Usage Data, No. 4 Recovery Boiler

	BLS Burning Rate (tons)			No. 6 Fuel Oil Burning Rate (10^3 gallons)						Monthly Heat Input (MMBtu/month)					Annual Heat Input (MMBtu/yr)				
						12-Month Total													
Month	Monthly	12-Month Total	24-Month Annual Average	Monthly Normal Usage	Monthly Startup Usage [b]	Normal Usage	Startup Usage	Total Usage	24-Month Annual Average	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil
March 2003	71,145	--	--	13.89	4.42	--	--	--	--	825,282	2,747	828,029	99.7	0.3	--	--	--	--	--
April 2003	66,750	--	--	13.99	4.45	--	--	--	--	774,300	2,766	777,066	99.6	0.4	--	--	--	--	--
May 2003	25,974	--	--	47.78	15.22	--	--	--	--	301,293	9,450	310,743	97.0	3.0	--	--	--	--	--
June 2003	57,900	--	--	47.01	14.97	--	--	--	--	671,640	9,297	680,937	98.6	1.4	--	--	--	--	--
July 2003	70,835	--	--	0.00	0.00	--	--	--	--	821,686	0	821,686	100.0	0.0	--	--	--	--	--
August 2003	68,820	--	--	34.60	11.02	--	--	--	--	798,312	6,842	805,154	99.2	0.8	--	--	--	--	--
September 2003	68,850	--	--	3.76	1.20	--	--	--	--	798,660	743	799,403	99.9	0.1	--	--	--	--	--
October 2003	69,440	--	--	3.85	1.23	--	--	--	--	805,504	762	806,266	99.9	0.1	--	--	--	--	--
November 2003	62,850	--	--	22.75	7.24	--	--	--	--	729,060	4,499	733,559	99.4	0.6	--	--	--	--	--
December 2003	60,140	--	--	22.00	7.00	--	--	--	--	697,624	4,350	701,974	99.4	0.6	--	--	--	--	--
January 2004	69,905	--	--	22.51	7.17	--	--	--	--	810,898	4,452	815,350	99.5	0.5	--	--	--	--	--
February 2004	64,525	757,134	--	9.80	3.12	241.94	77.04	77	--	748,490	1,937	750,427	99.7	0.3	8,782,749	47,846	8,830,596	99.5	0.5
March 2004	69,983	755,971	--	6.76	2.15	234.81	74.77	152	--	811,797	1,337	813,134	99.8	0.2	8,769,264	46,436	8,815,700	99.5	0.5
April 2004	47,006	736,227	--	21.48	6.84	242.30	77.15	229	--	545,266	4,248	549,515	99.2	0.8	8,540,231	47,918	8,588,149	99.4	0.6
May 2004	37,565	747,819	--	168.65	53.70	363.17	115.64	345	--	435,758	33,353	469,111	92.9	7.1	8,674,695	71,821	8,746,517	99.2	0.8
June 2004	66,450	756,369	--	42.15	13.42	358.31	114.09	459	--	770,820	8,335	779,155	98.9	1.1	8,773,875	70,859	8,844,735	99.2	0.8
July 2004	65,410	750,944	--	42.41	13.50	400.72	127.59	586	--	758,756	8,387	767,143	98.9	1.1	8,710,945	79,247	8,790,192	99.1	0.9
August 2004	71,300	753,424	--	3.22	1.03	369.34	117.60	704	--	827,080	638	827,718	99.9	0.1	8,739,713	73,042	8,812,755	99.2	0.8
September 2004	58,661	743,234	--	82.84	26.38	448.42	142.78	847	--	680,464	16,383	696,847	97.6	2.4	8,621,518	88,681	8,710,199	99.0	1.0
October 2004	71,145	744,939	--	15.17	4.83	459.74	146.39	993	--	825,282	3,000	828,282	99.6	0.4	8,641,296	90,919	8,732,215	99.0	1.0
November 2004	66,300	748,389	--	34.98	11.14	471.97	150.28	1,143	--	769,080	6,917	775,997	99.1	0.9	8,681,316	93,338	8,774,654	98.9	1.1
December 2004	69,440	757,689	--	22.32	7.11	472.30	150.38	1,294	--	805,504	4,415	809,919	99.5	0.5	8,789,196	93,402	8,882,598	98.9	1.1
January 2005	64,325	752,109	--	86.83	27.65	536.61	170.86	1,465	--	746,170	17,171	763,341	97.8	2.2	8,724,468	106,121	8,830,589	98.8	1.2
February 2005	63,000	750,584	753,859	18.31	5.83	545.12	173.57	1,561	518.83	730,800	3,620	734,420	99.5	0.5	8,706,778	107,804	8,814,582	98.8	1.2
March 2005	67,115	747,717	751,844	151.36	48.19	689.72	219.61	909.33	609.45	778,534	29,933	808,467	96.3	3.7	8,673,515	136,400	8,809,914	98.5	1.5
April 2005	55,307	756,018	746,123	137.20	43.69	805.44	256.46	1,061.90	690.68	641,563	27,133	668,696	95.9	4.1	8,769,811	159,285	8,929,096	98.2	1.8
May 2005	40,953	759,406	753,612	121.47	38.68	758.25	241.44	999.69	739.25	475,057	24,022	499,079	95.2	4.8	8,809,110	149,953	8,959,064	98.3	1.7
June 2005	67,800	760,756	758,562	13.52	4.30	729.62	232.32	961.94	717.17	786,480	2,673	789,153	99.7	0.3	8,824,770	144,291	8,969,062	98.4	1.6
July 2005	71,145	766,491	758,717	5.87	1.87	693.08	220.69	913.77	721.04	825,282	1,161	826,443	99.9	0.1	8,891,296	137,065	9,028,361	98.5	1.5
August 2005	69,595	764,786	759,105	35.06	11.16	724.92	230.82	955.74	721.34	807,302	6,934	814,236	99.1	0.9	8,871,518	143,361	9,014,879	98.4	1.6
September 2005	67,950	774,075	758,655	39.91	12.71	681.99	217.15	899.14	745.18	788,220	7,893	796,113	99.0	1.0	8,979,274	134,871	9,114,146	98.5	1.5
October 2005	70,029	772,959	758,949	33.22	10.58	700.04	222.90	922.94	764.54	812,336	6,570	818,907	99.2	0.8	8,966,329	138,442	9,104,770	98.5	1.5
November 2005	67,920	774,579	761,484	32.67	10.40	697.74	222.17	919.91	771.08	787,872	6,461	794,333	99.2	0.8	8,985,121	137,986	9,123,106	98.5	1.5
December 2005	65,658	770,797	764,243	74.94	23.86	750.36	238.92	989.28	805.98	761,633	14,821	776,454	98.1	1.9	8,941,249	148,392	9,089,641	98.4	1.6
January 2006	69,828	776,300	764,205	53.02	16.88	716.55	228.16	944.71	826.09	809,999	10,485	820,484	98.7	1.3	9,005,078	141,706	9,146,784	98.5	1.5
February 2006	61,138	774,438	762,511	143.02	45.54	841.26	267.87	1,109.13	913.91	709,201	28,283	737,484	96.2	3.8	8,983,479	166,369	9,149,848	98.2	1.8
March 2006	70,153	777,476	762,596	19.08	6.07	708.98	225.75	934.73	922.03	813,775	3,773	817,548	99.5	0.5	9,018,720	140,209	9,158,929	98.5	1.5
April 2006	62,698	784,867	770,442	19.77	6.29	591.54	188.35	779.90	920.90	727,297	3,909	731,206	99.5	0.5	9,104,454	116,985	9,221,439	98.7	1.3
May 2006	38,860	782,774	771,090	107.76	34.31	577.83	183.99	761.82	880.75	450,776	21,310	472,086	95.5	4.5	9,080,173	114,273	9,194,446	98.8	1.2
June 2006	62,280	777,254	769,005	109.96	35.01	674.28	214.70	888.97	925.46	722,448	21,746	744,194	97.1	2.9	9,016,141	133,346	9,149,487	98.5	1.5
July 2006	68,665	774,774	770,632	109.98	35.02	778.39	247.85	1,026.23	970.00	796,514	21,750	818,264	97.3	2.7	8,987,373	153,935	9,141,308	98.3	1.7
August 2006	65,426	770,604	767,695	27.44	8.74	770.77	245.42	1,016.19	985.96	758,936	5,427	764,363	99.3	0.7	8,939,006	152,428	9,091,434	98.3	1.7
September 2006	69,660	772,314	773,195	27.54	8.77	758.39	241.48	999.87	949.51	808,056	5,446	813,502	99.3	0.7	8,958,842	149,981	9,108,823	98.4	1.6
October 2006	72,788	775,073	774,016	57.73	18.38	782.90	249.29	1,032.19	977.57	844,341	11,418	855,759	98.7	1.3	8,990,847	154,828	9,145,675	98.3	1.7
November 2006	68,415	775,568	775,074	41.34	13.16	791.56	252.04	1,043.61	981.76	793,614	8,175	801,789	99.0	1.0	8,996,589	156,541	9,153,130	98.3	1.7
December 2006	71,827	781,737	776,267	13.96	4.44	730.58	232.62	963.20	976.24	833,193	2,760	835,953	99.7	0.3	9,068,149	144,480	9,212,630	98.4	1.6

Table 4-4: Annual Operating and Fuel Usage Data, No. 4 Recovery Boiler

	BLS Burning Rate (tons)			No. 6 Fuel Oil Burning Rate (10^3 gallons)						Monthly Heat Input (MMBtu/month)					Annual Heat Input (MMBtu/yr)				
						12-Month Total													
Month	Monthly	12-Month Total	24-Month Annual Average	Monthly Normal Usage	Monthly Startup Usage [b]	Normal Usage	Startup Usage	Total Usage	24-Month Annual Average	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil
January 2007	69,812	781,722	779,011	53.02	16.88	730.58	232.62	963.20	953.95	809,819	10,485	820,304	98.7	1.3	9,067,969	144,480	9,212,450	98.4	1.6
February 2007	59,794	780,378	777,408	133.80	42.60	721.36	229.69	951.05	1,030.09	693,610	26,460	720,070	96.3	3.7	9,052,379	142,657	9,195,036	98.4	1.6
March 2007	68,836	779,060	778,268	158.26	50.39	860.54	274.01	1,134.55	1,034.64	798,492	31,298	829,790	96.2	3.8	9,037,096	170,183	9,207,279	98.2	1.8
April 2007	63,510	779,872	782,369	125.61	40.00	966.39	307.71	1,274.10	1,027.00	736,716	24,841	761,557	96.7	3.3	9,046,515	191,115	9,237,630	97.9	2.1
May 2007	70,014	811,026	796,900	69.45	22.11	928.09	295.51	1,223.60	992.71	812,157	13,735	825,892	98.3	1.7	9,407,896	183,540	9,591,436	98.1	1.9
June 2007	68,535	817,281	797,267	71.34	22.71	889.46	283.22	1,172.68	1,030.83	795,006	14,108	809,114	98.3	1.7	9,480,454	175,902	9,656,355	98.2	1.8
July 2007	20,133	768,749	771,761	13.15	4.19	792.63	252.38	1,045.02	1,035.63	233,543	2,601	236,144	98.9	1.1	8,917,483	156,753	9,074,235	98.3	1.7
August 2007	46,506	749,829	760,217	27.53	8.76	792.72	252.41	1,045.13	1,030.66	539,470	5,444	544,913	99.0	1.0	8,698,016	156,770	8,854,786	98.2	1.8
September 2007	67,635	747,804	760,059	127.70	40.66	892.88	284.30	1,177.18	1,088.53	784,566	25,254	809,820	96.9	3.1	8,674,526	176,578	8,851,104	98.0	2.0
October 2007	71,068	746,084	760,578	108.56	34.57	943.71	300.49	1,244.20	1,138.19	824,383	21,470	845,853	97.5	2.5	8,654,569	186,630	8,841,198	97.9	2.1
November 2007	68,025	745,694	760,631	41.98	13.37	944.36	300.69	1,245.05	1,144.33	789,090	8,302	797,392	99.0	1.0	8,650,045	186,758	8,836,802	97.9	2.1
December 2007	70,944	744,810	763,274	81.52	25.96	1,011.92	322.21	1,334.13	1,148.67	822,945	16,122	839,066	98.1	1.9	8,639,796	200,119	8,839,915	97.7	2.3
January 2008	73,796	748,794	765,258	112.72	1.22	1,071.63	306.55	1,378.18	1,170.69	856,028	17,092	873,120	98.0	2.0	8,686,005	206,727	8,892,731	97.7	2.3
February 2008	67,686	756,686	768,532	75.59	13.66	1,013.42	277.61	1,291.03	1,121.04	785,158	13,388	798,545	98.3	1.7	8,777,552	193,654	8,971,206	97.8	2.2
March 2008	72,695	760,545	769,803	65.37	2.12	920.53	229.33	1,149.86	1,142.21	843,262	10,124	853,386	98.8	1.2	8,822,322	172,479	8,994,801	98.1	1.9
April 2008	64,755	761,790	770,831	184.89	3.05	979.81	192.39	1,172.20	1,223.15	751,158	28,191	779,349	96.4	3.6	8,836,764	175,830	9,012,594	98.0	2.0
May 2008	69,812	761,589	786,307	161.67	22.94	1,072.03	193.22	1,265.25	1,244.42	809,819	27,692	837,512	96.7	3.3	8,834,427	189,787	9,024,214	97.9	2.1
June 2008	67,725	760,779	789,030	186.31	15.99	1,187.00	186.50	1,373.50	1,273.09	785,610	30,345	815,955	96.3	3.7	8,825,031	206,025	9,031,055	97.7	2.3
July 2008	74,183	814,829	791,789	121.56	1.03	1,295.41	183.34	1,478.75	1,261.88	860,523	18,389	878,911	97.9	2.1	9,452,011	221,812	9,673,823	97.7	2.3
August 2008	63,364	831,687	790,758	373.69	15.78	1,641.57	190.35	1,831.93	1,438.53	735,022	58,421	793,443	92.6	7.4	9,647,563	274,789	9,922,353	97.2	2.8
September 2008	67,515	831,567	789,685	220.91	37.85	1,734.79	187.55	1,922.34	1,549.76	783,174	38,815	821,989	95.3	4.7	9,646,171	288,350	9,934,522	97.1	2.9
October 2008	45,220	805,719	775,901	24.18	23.74	1,650.40	176.72	1,827.12	1,535.66	524,552	7,188	531,740	98.6	1.4	9,346,340	274,068	9,620,409	97.2	2.8
November 2008	64,125	801,819	773,756	427.03	1.93	2,035.45	165.29	2,200.74	1,722.89	743,850	64,344	808,194	92.0	8.0	9,301,100	330,110	9,631,211	96.6	3.4
December 2008	46,175	777,050	760,930	298.94	26.37	2,252.87	165.70	2,418.57	1,876.35	535,624	48,797	584,421	91.7	8.3	9,013,780	362,786	9,376,566	96.1	3.9
January 2009	46,655	749,910	749,352	531.94	28.72	2,672.08	193.19	2,865.28	2,121.73	541,198	84,098	625,296	86.6	13.4	8,698,950	429,792	9,128,742	95.3	4.7
February 2009	44,338	726,562	741,624	130.49	81.13	2,726.99	260.66	2,987.65	2,139.34	514,321	31,743	546,063	94.2	5.8	8,428,113	448,147	8,876,260	95.0	5.0
March 2009	61,318	715,185	737,865	130.80	29.74	2,792.42	288.28	3,080.70	2,115.28	711,289	24,081	735,370	96.7	3.3	8,296,140	462,104	8,758,245	94.7	5.3
April 2009	51,510	701,940	731,865	510.28	2.56	3,117.80	287.79	3,405.59	2,288.90	597,516	76,926	674,442	88.6	11.4	8,142,498	510,839	8,653,337	94.1	5.9
May 2009	50,654	682,782	722,185	165.66	2.26	3,121.79	267.10	3,388.90	2,327.07	587,586	25,188	612,774	95.9	4.1	7,920,265	508,334	8,428,600	94.0	6.0
June 2009	43,320	658,377	709,578	215.85	42.44	3,151.33	293.55	3,444.89	2,409.19	502,512	38,744	541,256	92.8	7.2	7,637,167	516,733	8,153,901	93.7	6.3
July 2009	61,613	645,806	730,317	53.63	1.32	3,083.40	293.84	3,377.24	2,428.00	714,705	8,242	722,947	98.9	1.1	7,491,350	506,586	7,997,936	93.7	6.3
August 2009	51,197	633,639	732,663	517.70	11.26	3,227.41	289.33	3,516.74	2,674.33	593,879	79,345	673,224	88.2	11.8	7,350,207	527,510	7,877,717	93.3	6.7
September 2009	62,595	628,719	730,143	121.63	1.91	3,128.12	253.39	3,381.51	2,651.92	726,102	18,531	744,633	97.5	2.5	7,293,135	507,226	7,800,361	93.5	6.5
October 2009	71,161	654,659	730,189	108.09	2.16	3,212.04	231.80	3,443.84	2,635.48	825,462	16,537	841,999	98.0	2.0	7,594,044	516,575	8,110,620	93.6	6.4
November 2009	67,680	658,214	730,017	91.07	50.26	2,876.08	280.13	3,156.21	2,678.47	785,088	21,201	806,289	97.4	2.6	7,635,282	473,432	8,108,714	94.2	5.8
December 2009	65,596	677,636	727,343	125.50	14.63	2,702.64	268.39	2,971.03	2,694.80	760,914	21,019	781,933	97.3	2.7	7,860,572	445,654	8,306,226	94.6	5.4
January 2010	45,072	676,053	712,981	381.77	36.11	2,552.48	275.78	2,828.25	2,846.77	522,835	62,682	585,518	89.3	10.7	7,842,209	424,238	8,266,447	94.9	5.1
February 2010	33,273	664,988	695,775	22.84	105.55	2,444.82	300.20	2,745.02	2,866.33	385,967	19,258	405,225	95.2	4.8	7,713,855	411,754	8,125,609	94.9	5.1
March 2010	72,308	675,977	695,581	122.26	36.44	2,436.29	306.91	2,743.19	2,911.94	838,767	23,806	862,573	97.2	2.8	7,841,333	411,479	8,252,812	95.0	5.0
April 2010	67,050	691,517	696,728	127.32	4.34	2,053.33	308.68	2,362.01	2,883.80	777,780	19,749	797,529	97.5	2.5	8,021,597	354,302	8,375,899	95.8	4.2
May 2010	60,497	701,360	692,071	263.54	58.67	2,151.21	365.10	2,516.31	2,952.60	701,759	48,332	750,092	93.6	6.4	8,135,770	377,447	8,513,217	95.6	4.4
June 2010	62,820	720,860	689,618	93.35	0.00	2,028.71	322.65	2,351.36	2,898.13	728,712	14,003	742,715	98.1	1.9	8,361,970	352,705	8,714,675	96.0	4.0
July 2010	65,860	725,107	685,456	43.46	24.79	2,018.54	346.13	2,364.67	2,870.96	763,970	10,238	774,208	98.7	1.3	8,411,235	354,701	8,765,937	96.0	4.0
August 2010	69,440	743,350	688,494	93.14	0.00	1,593.99	334.87	1,928.85	2,722.79	805,504	13,971	819,475	98.3	1.7	8,622,860	289,328	8,912,188	96.8	3.2
September 2010	66,555	747,310	688,014	146.63	0.00	1,618.99	332.96	1,951.95	2,666.73	772,038	21,995	794,033	97.2	2.8	8,668,796	292,792	8,961,588	96.7	3.3
October 2010	61,597	737,747	696,203	190.07	0.00	1,700.97	330.80	2,031.77	2,737.80	714,525	28,510	743,036	96.2	3.8	8,557,859	304,765	8,862,625	96.6	3.4
November 2010	59,610	729,677	693,945	59.61	0.00	1,669.51	280.54	1,950.04	2,553.13	691,476	8,942	700,418	98.7	1.3	8,464,247	292,507	8,756,754	96.7	3.3
December 2010	53,119	717,199	697,417	204.62	124.37	1,748.62	390.28	2,138.90	2,554.96	616,175	49,348	665,522	92.6	7.4	8,319,508	320,835	8,640,343	96.3	3.7

Golder Associates

Table 4-4: Annual Operating and Fuel Usage Data, No. 4 Recovery Boiler

	BLS Burning Rate (tons)			No. 6 Fuel Oil Burning Rate (10^3 gallons)						Monthly Heat Input (MMBtu/month)					Annual Heat Input (MMBtu/yr)				
Month	Monthly	12-Month Total	24-Month Annual Average	Monthly Normal Usage	Monthly Startup Usage [b]	12-Month Total Normal Usage	12-Month Total Startup Usage	12-Month Total Total Usage	24-Month Annual Average	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil	BLS [a]	No. 6 Fuel Oil [a]	Total	% from BLS	% from No. 6 Fuel Oil
January 2011	58,218	730,345	703,199	161.85	6.63	1,528.70	360.80	1,889.49	2,358.87	681,151	25,271	706,422	96.4	3.6	8,545,037	283,424	8,828,460	96.8	3.2
February 2011	31,714	728,786	696,887	15.75	141.80	1,521.61	397.04	1,918.65	2,331.84	371,048	23,632	394,680	94.0	6.0	8,526,790	287,798	8,814,589	96.7	3.3
March 2011	64,728	721,206	698,592	200.06	9.81	1,599.41	370.41	1,969.82	2,356.51	757,318	31,481	788,799	96.0	4.0	8,438,110	295,473	8,733,583	96.6	3.4
April 2011	61,575	715,731	703,624	130.83	25.62	1,602.91	391.70	1,994.61	2,178.31	720,428	23,468	743,895	96.8	3.2	8,374,053	299,192	8,673,244	96.6	3.4
May 2011	58,327	713,562	707,461	176.60	57.59	1,515.98	390.61	1,906.59	2,211.45	682,426	35,129	717,555	95.1	4.9	8,348,670	285,988	8,634,658	96.7	3.3
June 2011	62,565	713,307	717,083	55.55	33.24	1,478.18	423.85	1,902.02	2,126.69	732,011	13,318	745,329	98.2	1.8	8,345,686	285,304	8,630,990	96.7	3.3
July 2011	64,248	711,695	718,401	27.55	0.00	1,462.27	399.05	1,861.32	2,113.00	751,696	4,133	755,829	99.5	0.5	8,326,826	279,198	8,606,024	96.8	3.2
August 2011	60,466	702,720	723,035	125.74	32.82	1,494.87	431.88	1,926.74	1,927.80	707,446	23,784	731,231	96.7	3.3	8,221,824	289,011	8,510,835	96.6	3.4
September 2011	60,855	697,020	722,165	66.38	0.00	1,414.61	431.88	1,846.49	1,899.22	712,004	9,957	721,960	98.6	1.4	8,155,134	276,973	8,432,107	96.7	3.3
October 2011	63,364	698,787	718,267	162.92	0.00	1,387.46	431.88	1,819.34	1,925.55	741,359	24,438	765,797	96.8	3.2	8,175,808	272,900	8,448,708	96.8	3.2
November 2011	51,660	690,837	710,257	191.61	67.02	1,519.46	498.90	2,018.36	1,984.20	604,422	38,795	643,217	94.0	6.0	8,082,793	302,754	8,385,547	96.4	3.6
December 2011	51,956	689,675	703,437	408.79	7.56	1,723.63	382.09	2,105.72	2,122.31	607,885	62,452	670,337	90.7	9.3	8,069,192	315,858	8,385,050	96.2	3.8
January 2012	49,497	680,954	705,649	155.24	92.89	1,717.03	468.36	2,185.38	2,037.44	579,115	37,220	616,335	94.0	6.0	7,967,156	327,807	8,294,963	96.0	4.0
February 2012	58,234	707,474	718,130	58.83	44.99	1,760.10	371.55	2,131.65	2,025.15	681,338	15,573	696,910	97.8	2.2	8,277,446	319,748	8,597,193	96.3	3.7
March 2012	59,930	702,676	711,941	44.97	53.98	1,605.01	415.71	2,020.73	1,995.27	701,181	14,843	716,024	97.9	2.1	8,221,309	303,109	8,524,418	96.4	3.6
April 2012	18,268	659,369	687,550	6.47	4.20	1,480.65	394.29	1,874.95	1,934.78	213,736	1,600	215,336	99.3	0.7	7,714,617	281,242	7,995,859	96.5	3.5
May 2012	45,893	646,935	680,248	43.21	90.01	1,347.26	426.72	1,773.98	1,840.28	536,948	19,984	556,932	96.4	3.6	7,569,140	266,097	7,835,236	96.6	3.4
June 2012	55,115	639,485	676,396	32.79	15.17	1,324.50	408.66	1,733.15	1,817.59	644,846	7,195	652,040	98.9	1.1	7,481,975	259,973	7,741,947	96.6	3.4
July 2012	60,140	635,378	673,536	33.87	21.40	1,330.82	430.06	1,760.87	1,811.10	703,638	8,291	711,929	98.8	1.2	7,433,917	264,131	7,698,048	96.6	3.4
August 2012	58,804	633,716	668,218	6.11	8.84	1,211.19	406.07	1,617.26	1,772.00	688,007	2,243	690,250	99.7	0.3	7,414,477	242,589	7,657,067	96.8	3.2
September 2012	56,204	629,065	663,043	25.35	6.36	1,170.16	412.43	1,582.60	1,714.54	657,587	4,757	662,343	99.3	0.7	7,360,061	237,389	7,597,450	96.9	3.1
October 2012	57,752	623,453	661,120	2.44	0.00	1,009.68	412.43	1,422.11	1,620.72	675,698	365	676,064	99.9	0.1	7,294,400	213,317	7,507,717	97.2	2.8
November 2012	50,592	622,385	656,611	131.21	0.00	949.28	345.41	1,294.69	1,656.52	591,926	19,681	611,608	96.8	3.2	7,281,905	194,203	7,476,107	97.4	2.6
December 2012	62,543	632,972	661,323	48.94	36.57	589.43	374.42	963.85	1,534.79	731,753	12,827	744,580	98.3	1.7	7,405,772	144,578	7,550,350	98.1	1.9
Minimum:	**18,268**	**622,385**	**656,611**	**0.00**	**0.00**	**234.81**	**74.77**	**77.04**	**518.83**	**213,736**	**0**	**215,336**	**86.6**	**0.0**	**7,281,905**	**46,436**	**7,476,107**	**93.3**	**0.5**
Average:	**60,782**	**732,550**	**736,566**	**103.32**	**21.96**	**1,327.12**	**274.64**	**1,630.46**	**1,665.01**	**706,191**	**18,793**	**724,984**	**97.3**	**2.7**	**8,512,839**	**240,265**	**8,753,103**	**97.2**	**2.8**
Maximum:	**74,183**	**831,687**	**797,267**	**531.94**	**141.80**	**3,227.41**	**498.90**	**3,516.74**	**2,952.60**	**860,523**	**84,098**	**878,911**	**100.0**	**13.4**	**9,647,563**	**527,510**	**9,934,522**	**99.5**	**6.7**

[a] Based on heat content of 5,768 Btu/lb for black liquor solids and 150,000 Btu/gal for No. 6 fuel oil.

[b] Fuel oil burned during startup not tracked separately until January 2010. Startup usage for previous years based on average percentage of total oil that is burned during startup on a monthly basis from January 2010 through December 2012.

Table 4-5: Baseline Actual Monthly Emissions (March 2003 - December 2012), No. 4 Recovery Boiler

	Pollutant Emission Rate (tons/month)																
Month	SO_2 [a]	NO_x [a]	CO [a]	PM [a]	PM_{10} [b]	$PM_{2.5}$ [b]	VOC	SAM	TRS [a]	Lead	Mercury	Biogenic CO_2	Non-Biogenic CO_2	CH_4	N_2O	GHGs [c]	CO_2e [c]
March 2003	2.68	40.59	95.84	8.97	8.65	6.72	1.46	0.18	0.75	0.00036	0.00012	85,877	227	27.30	4.55	259	2,211
April 2003	2.56	38.11	89.92	8.41	8.11	6.31	1.37	0.17	0.70	0.00034	0.00011	80,572	229	25.61	4.27	259	2,090
May 2003	3.41	16.14	35.13	3.28	3.20	2.50	0.54	0.17	0.27	0.00017	0.00005	31,352	782	9.99	1.67	794	1,509
June 2003	4.21	34.14	78.12	7.30	7.08	5.51	1.20	0.23	0.61	0.00033	0.00010	69,890	770	22.24	3.71	796	2,386
July 2003	1.88	39.99	95.38	8.93	8.59	6.68	1.45	0.14	0.74	0.00035	0.00012	85,503	0	27.17	4.53	32	1,975
August 2003	3.79	39.92	92.78	8.68	8.39	6.52	1.42	0.23	0.72	0.00037	0.00012	83,071	566	26.42	4.40	597	2,487
September 2003	2.04	38.98	92.72	8.68	8.36	6.49	1.41	0.15	0.72	0.00034	0.00012	83,107	62	26.41	4.40	92	1,981
October 2003	2.06	39.32	93.51	8.75	8.43	6.55	1.42	0.15	0.73	0.00034	0.00012	83,819	63	26.64	4.44	94	1,999
November 2003	2.96	36.18	84.70	7.92	7.65	5.95	1.29	0.18	0.66	0.00033	0.00011	75,865	372	24.12	4.02	401	2,126
December 2003	2.85	34.63	81.05	7.58	7.32	5.69	1.24	0.18	0.63	0.00032	0.00010	72,593	360	23.08	3.85	387	2,038
January 2004	3.13	40.16	94.20	8.81	8.51	6.61	1.44	0.20	0.73	0.00037	0.00012	84,380	369	26.83	4.47	400	2,318
February 2004	2.26	36.73	86.92	8.13	7.84	6.09	1.32	0.15	0.68	0.00033	0.00011	77,886	160	24.76	4.13	189	1,960
March 2004	2.24	39.71	94.25	8.82	8.50	6.60	1.44	0.16	0.73	0.00035	0.00012	84,474	111	26.85	4.48	142	2,062
April 2004	2.46	27.20	63.36	5.93	5.73	4.45	0.97	0.15	0.49	0.00025	0.00008	56,739	352	18.05	3.01	373	1,663
May 2004	10.55	26.43	51.14	4.75	4.74	3.72	0.80	0.50	0.39	0.00035	0.00008	45,344	2,761	14.52	2.42	2,778	3,817
June 2004	4.15	38.82	89.61	8.38	8.11	6.31	1.37	0.24	0.70	0.00037	0.00012	80,210	690	25.52	4.25	720	2,545
July 2004	4.14	38.24	88.21	8.25	7.98	6.21	1.35	0.24	0.69	0.00036	0.00011	78,955	694	25.12	4.19	724	2,520
August 2004	2.07	40.35	96.02	8.98	8.65	6.72	1.46	0.15	0.75	0.00035	0.00012	86,064	53	27.35	4.56	85	2,040
September 2004	6.25	35.68	79.26	7.40	7.21	5.61	1.22	0.33	0.62	0.00037	0.00011	70,808	1,356	22.56	3.76	1,383	2,996
October 2004	2.74	40.63	95.85	8.97	8.65	6.72	1.46	0.18	0.75	0.00036	0.00012	85,877	248	27.30	4.55	280	2,232
November 2004	3.74	38.51	89.39	8.36	8.08	6.29	1.37	0.22	0.70	0.00036	0.00011	80,029	573	25.46	4.24	602	2,423
December 2004	3.10	39.89	93.57	8.75	8.45	6.57	1.43	0.20	0.73	0.00036	0.00012	83,819	365	26.65	4.44	397	2,302
January 2005	5.31	39.00	86.90	8.11	7.90	6.15	1.33	0.29	0.68	0.00040	0.00012	77,645	1,421	24.73	4.12	1,450	3,219
February 2005	2.43	36.13	84.89	7.94	7.66	5.96	1.29	0.16	0.66	0.00033	0.00011	76,046	300	24.18	4.03	328	2,057
March 2005	8.06	42.58	90.87	8.47	8.30	6.48	1.40	0.41	0.70	0.00048	0.00012	81,013	2,478	25.84	4.31	2,508	4,357
April 2005	7.16	35.47	74.92	6.98	6.85	5.35	1.16	0.36	0.58	0.00041	0.00010	66,760	2,246	21.31	3.55	2,271	3,795
May 2005	6.13	26.88	55.54	5.17	5.10	3.98	0.86	0.31	0.43	0.00032	0.00008	49,434	1,989	15.79	2.63	2,007	3,137
June 2005	2.36	38.69	91.34	8.54	8.24	6.40	1.39	0.16	0.71	0.00035	0.00012	81,840	221	26.02	4.34	252	2,112
July 2005	2.13	40.34	95.82	8.96	8.64	6.71	1.46	0.15	0.75	0.00035	0.00012	85,877	96	27.30	4.55	128	2,080
August 2005	3.30	40.37	93.83	8.77	8.48	6.60	1.43	0.20	0.73	0.00038	0.00012	84,006	574	26.72	4.45	605	2,516
September 2005	3.46	39.59	91.63	8.57	8.29	6.45	1.40	0.21	0.71	0.00037	0.00012	82,021	653	26.09	4.35	684	2,550
October 2005	3.24	40.56	94.40	8.83	8.53	6.63	1.44	0.20	0.74	0.00038	0.00012	84,530	544	26.89	4.48	575	2,498
November 2005	3.16	39.35	91.56	8.56	8.28	6.43	1.40	0.20	0.71	0.00037	0.00012	81,984	535	26.08	4.35	565	2,430
December 2005	4.85	39.39	88.66	8.28	8.05	6.27	1.36	0.27	0.69	0.00040	0.00012	79,254	1,227	25.24	4.21	1,256	3,061
January 2006	4.08	41.06	94.20	8.80	8.53	6.64	1.44	0.24	0.73	0.00040	0.00012	84,287	868	26.82	4.47	899	2,817
February 2006	7.63	38.94	82.79	7.72	7.57	5.91	1.28	0.39	0.64	0.00044	0.00011	73,798	2,341	23.55	3.93	2,369	4,053
March 2006	2.66	40.19	94.52	8.84	8.53	6.63	1.44	0.18	0.74	0.00036	0.00012	84,680	312	26.92	4.49	344	2,269
April 2006	2.49	36.01	84.49	7.90	7.63	5.93	1.29	0.16	0.66	0.00033	0.00011	75,681	324	24.06	4.01	352	2,072
May 2006	5.56	25.28	52.68	4.91	4.83	3.77	0.82	0.28	0.41	0.00030	0.00007	46,907	1,764	14.98	2.50	1,782	2,853
June 2006	6.27	38.56	84.22	7.86	7.67	5.98	1.30	0.33	0.65	0.00041	0.00011	75,177	1,800	23.96	4.00	1,828	3,542
July 2006	6.44	42.17	92.82	8.66	8.45	6.58	1.43	0.34	0.72	0.00045	0.00012	82,884	1,801	26.41	4.40	1,831	3,721
August 2006	2.89	37.78	88.19	8.25	7.97	6.19	1.35	0.18	0.69	0.00035	0.00011	78,973	449	25.12	4.19	479	2,274
September 2006	3.00	40.18	93.89	8.78	8.48	6.59	1.43	0.19	0.73	0.00037	0.00012	84,085	451	26.74	4.46	482	2,394
October 2006	4.36	42.88	98.20	9.18	8.89	6.92	1.50	0.25	0.76	0.00041	0.00013	87,860	945	27.96	4.66	978	2,977
November 2006	3.55	39.90	92.26	8.62	8.34	6.49	1.41	0.21	0.72	0.00038	0.00012	82,582	677	26.27	4.38	707	2,586
December 2006	2.49	40.98	96.76	9.05	8.73	6.78	1.48	0.17	0.75	0.00037	0.00012	86,700	228	27.56	4.59	261	2,231
January 2007	2.56	40.32	114.70	4.79	5.66	4.64	1.86	0.17	0.35	0.00040	0.00012	84,268	868	26.81	4.47	899	2,817
February 2007	5.89	37.27	98.53	4.11	4.94	4.06	1.61	0.31	0.30	0.00043	0.00011	72,176	2,190	23.02	3.84	2,217	3,864
March 2007	6.96	43.04	113.45	4.73	5.70	4.68	1.85	0.36	0.34	0.00050	0.00013	83,090	2,591	26.51	4.42	2,622	4,518
April 2007	5.57	39.08	104.60	4.36	5.23	4.30	1.71	0.30	0.32	0.00044	0.00012	76,661	2,056	24.44	4.08	2,085	3,834
May 2007	3.25	40.94	115.09	4.80	5.70	4.67	1.87	0.20	0.35	0.00041	0.00012	84,511	1,137	26.90	4.49	1,168	3,092
June 2007	3.32	40.18	112.67	4.70	5.58	4.57	1.83	0.20	0.34	0.00041	0.00012	82,727	1,168	26.34	4.39	1,199	3,082
July 2007	0.65	11.56	33.07	1.38	1.63	1.33	0.54	0.04	0.10	0.00011	0.00004	24,302	215	7.73	1.29	224	777
August 2007	1.38	26.62	76.38	3.19	3.77	3.08	1.24	0.10	0.23	0.00026	0.00008	56,136	451	17.86	2.98	471	1,748
September 2007	5.67	41.43	111.38	4.65	5.57	4.57	1.82	0.30	0.34	0.00046	0.00012	81,640	2,091	26.03	4.34	2,121	3,983
October 2007	4.89	42.73	116.94	4.88	5.82	4.77	1.90	0.27	0.36	0.00046	0.00013	85,784	1,777	27.33	4.56	1,809	3,764
November 2007	2.09	38.99	111.73	4.66	5.51	4.51	1.81	0.15	0.34	0.00038	0.00012	82,111	687	26.12	4.35	718	2,586
December 2007	3.76	41.83	116.65	4.87	5.79	4.74	1.90	0.22	0.35	0.00043	0.00013	85,634	1,335	27.27	4.55	1,366	3,317
January 2008	0.28	39.17	104.07	5.06	6.02	4.93	1.97	0.08	0.94	0.00045	0.00013	89,077	1,415	28.36	4.73	1,448	3,477
February 2008	3.12	35.82	95.18	4.64	5.51	4.51	1.81	0.15	0.83	0.00040	0.00012	81,702	1,108	26.01	4.34	1,139	2,999
March 2008	0.48	38.28	101.71	4.98	5.89	4.82	1.94	0.09	0.92	0.00041	0.00013	87,748	838	27.92	4.65	871	2,867
April 2008	0.70	35.19	97.92	4.45	5.35	4.40	1.74	0.08	0.55	0.00046	0.00012	78,164	2,334	24.93	4.16	2,363	4,147
May 2008	5.23	34.35	104.39	4.80	5.76	4.72	1.88	0.21	0.44	0.00048	0.00013	84,268	2,292	26.87	4.48	2,324	4,246
June 2008	3.65	34.16	85.23	4.65	5.60	4.60	1.82	0.17	0.39	0.00048	0.00013	81,749	2,512	26.08	4.35	2,543	4,408
July 2008	0.23	36.09	139.49	5.09	6.06	4.96	1.98	0.08	0.50	0.00046	0.00013	89,544	1,522	28.52	4.75	1,556	3,595
August 2008	3.60	39.12	111.30	4.37	5.40	4.46	1.73	0.16	0.35	0.00060	0.00013	76,485	4,836	24.50	4.09	4,865	6,619
September 2008	8.63	37.43	98.84	4.64	5.63	4.63	1.83	0.30	0.28	0.00053	0.00013	81,496	3,213	26.03	4.34	3,244	5,106
October 2008	5.42	24.92	52.92	3.10	3.67	3.00	1.21	0.19	0.19	0.00026	0.00008	54,584	595	17.37	2.90	615	1,858
November 2008	0.44	39.46	90.06	4.43	5.49	4.54	1.76	0.08	0.23	0.00064	0.00013	77,404	5,327	24.81	4.14	5,356	7,132
December 2008	6.02	26.64	36.32	3.19	3.97	3.28	1.27	0.21	0.26	0.00047	0.00010	55,736	4,040	17.87	2.98	4,060	5,340
January 2009	6.98	31.08	56.45	3.24	4.20	3.50	1.31	0.24	0.40	0.00065	0.00011	56,316	6,962	18.18	3.04	6,983	8,286
February 2009	19.72	27.08	38.60	3.05	3.73	3.07	1.20	0.58	0.29	0.00038	0.00009	53,519	2,628	17.11	2.86	2,648	3,872
March 2009	7.22	34.59	39.98	4.21	5.05	4.15	1.65	0.26	0.35	0.00042	0.00011	74,015	1,994	23.60	3.94	2,021	3,709
April 2009	0.62	32.34	59.87	3.57	4.55	3.78	1.44	0.07	0.30	0.00064	0.00012	62,176	6,368	20.01	3.34	6,392	7,825
May 2009	0.55	25.00	28.98	3.48	4.20	3.46	1.37	0.07	0.23	0.00038	0.00010	61,143	2,085	19.51	3.26	2,108	3,504
June 2009	10.32	24.86	25.29	2.99	3.69	3.04	1.18	0.33	0.29	0.00041	0.00009	52,290	3,207	16.75	2.80	3,227	4,426
July 2009	0.32	29.10	51.17	4.22	4.99	4.09	1.64	0.07	0.34	0.00034	0.00011	74,371	682	23.66	3.94	710	2,402
August 2009	2.74	32.78	43.18	3.55	4.54	3.77	1.43	0.13	0.33	0.00065	0.00012	61,798	6,568	19.90	3.33	6,592	8,017
September 2009	0.46	31.57	62.59	4.30	5.13	4.20	1.68	0.08	0.32	0.00040	0.00011	75,557	1,534	24.07	4.01	1,562	3,284
October 2009	0.52	33.97	91.91	4.88	5.81	4.76	1.90	0.09	0.40	0.00043	0.00013	85,896	1,369	27.35	4.56	1,401	3,357
November 2009	12.20	39.88	103.40	4.65	5.55	4.55	1.81	0.40	0.57	0.00044	0.00012	81,695	1,755	26.03	4.34	1,785	3,647
December 2009	3.55	36.68	80.75	4.50	5.38	4.41	1.76	0.16	0.63	0.00043	0.00012	79,179	1,740	25.23	4.21	1,769	3,574
January 2010	9.62	29.99	61.59	3.12	3.95	3.28	1.25	0.27	0.48	0.00054	0.00010	54,405	5,189	17.50	2.92	5,209	6,463
February 2010	15.22	22.26	28.09	2.29	2.78	2.28	0.90	0.69	0.17	0.00026	0.00006	40,163	1,594	12.83	2.14	1,609	2,527
March 2010	5.50	39.36	62.34	4.97	5.94	4.87	1.94	0.30	0.45	0.00047	0.00013	87,280	1,971	27.82	4.64	2,003	3,993
April 2010	0.96	34.62	72.43	4.60	5.49	4.50	1.80	0.09	0.41	0.00043	0.00012	80,934	1,635	25.79	4.30	1,665	3,509
May 2010	9.25	37.39	69.01	4.17	5.12	4.22	1.65	0.43	0.36	0.00054	0.00012	73,024	4,001	23.37	3.90	4,028	5,701
June 2010	0.26	32.14	60.05	4.31	5.12	4.19	1.68	0.06	0.35	0.00038	0.00011	75,828	1,159	24.14	4.03	1,187	2,914
July 2010	3.82	35.07	75.36	4.52	5.35	4.37	1.75	0.22	0.40	0.00037	0.00012	79,497	848	25.30	4.22	877	2,686
August 2010	0.29	33.87	92.83	4.76	5.65	4.63	1.85	0.07	0.31	0.00041	0.00012	83,819	1,157	26.68	4.45	1,188	3,096
September 2010	0.28	32.96	54.70	4.57	5.46	4.48	1.78	0.07	0.26	0.00044	0.00012	80,337	1,821	25.60	4.27	1,851	3,682
October 2010	1.19	31.46	40.19	4.23	5.10	4.19	1.66	0.06	0.21	0.00045	0.00011	74,352	2,360	23.72	3.96	2,388	4,085
November 2010	0.31	29.79	60.76	4.09	4.84	3.96	1.59	0.06	0.20	0.00034	0.00010	71,954	740	22.90	3.82	767	2,404
December 2010	19.92	35.19	45.76	3.66	4.53	3.74	1.45	0.83	0.32	0.00051	0.00010	64,118	4,085	20.54	3.43	4,109	5,579
January 2011	1.62	31.73	62.09	4.00	4.81	3.95	1.57	0.10	0.30	0.00041	0.00011	70,879	2,092	22.61	3.77	2,118	3,736
February 2011	21.54	20.52	48.82	2.19	2.67	2.20	0.86	0.97	0.22	0.00027	0.00006	38,611	1,956	12.35	2.06	1,971	2,854
March 2011	2.17	33.99	68.55	4.45	5.37	4.41	1.74	0.13	0.45	0.00048	0.00012	78,805	2,606	25.15	4.19	2,635	4,435
April 2011	4.49	31.09	94.05	4.23	5.07	4.16	1.65	0.23	1.19	0.00042	0.00011	74,966	1,943	23.90	3.99	1,971	3,680
May 2011	9.25	34.16	61.81	4.01	4.87	4.01	1.58	0.44	0.44	0.00046	0.00011	71,012	2,908	22.68	3.78	2,935	4,558
June 2011	5.62	31.03	80.49	4.29	5.10	4.17	1.67	0.28	0.45	0.00037	0.00011	76,172	1,103	24.25	4.04	1,131	2,865
July 2011	0.67	31.10	71.34	4.40	5.18	4.24	1.71	0.06	0.07	0.00034	0.00011	78,220	342	24.87	4.15	371	2,150
August 2011	5.55	31.10	65.68	4.15	4.98	4.09	1.62	0.28	0.14	0.00042	0.00011	73,615	1,969	23.47	3.91	1,996	3,675
September 2011	5.23	27.51	51.36	4.17	4.94	4.04	1.62	0.06	0.34	0.00035	0.00011	74,090	824	23.58	3.93	852	2,538
October 2011	14.66	29.89	56.07	4.35	5.22	4.29	1.70	0.06	0.36	0.00043	0.00012	77,144	2,023	24.60	4.10	2,052	3,811
November 2011	12.10	30.45	36.56	3.56	4.36	3.59	1.41	0.50	0.31	0.00045	0.00010	62,895	3,212	20.12	3.36	3,235	4,675
December 2011	1.74	31.26	73.97	3.59	4.51	3.74	1.44	0.10	0.32	0.00057	0.00011	63,255	5,170	20.31	3.39	5,194	6,648
January 2012	13.81	30.85	44.85	3.41	4.17	3.44	1.35	0.64	0.19	0.00043	0.00010	60,262	3,081	19.27	3.22	3,104	4,483
February 2012	6.79	29.80	71.10	4.00	4.76	3.90	1.56	0.34	0.23	0.00036	0.00010	70,899	1,289	22.58	3.77	1,315	2,931
March 2012	8.04	31.02	69.66	4.11	4.89	4.01	1.60	0.40	0.23	0.00037	0.00011	72,964	1,229	23.24	3.87	1,256	2,918
April 2012	0.67	8.18	13.06	1.25	1.48	1.21	0.49	0.04	0.05	0.00010	0.00003	22,241	132	7.07	1.18	141	647
May 2012	13.08	25.48	46.04	3.15	3.79	3.12	1.23	0.62	0.15	0.00033	0.00009	55,874	1,654	17.82	2.97	1,675	2,950
June 2012	2.41	28.23	32.85	3.78	4.47	3.65	1.47	0.16	0.22	0.00031	0.00010	67,101	596	21.35	3.56	621	2,147
July 2012	3.31	28.59	35.36	4.12	4.88	3.99	1.60	0.20	0.21	0.00034	0.00010	73,219	686	23.30	3.88	714	2,379
August 2012	1.62	27.99	28.22	4.03	4.74	3.87	1.56	0.12	0.18	0.00030	0.00010	71,593	186	22.76	3.79	212	1,840
September 2012	1.15	27.39	24.29	3.85	4.54	3.71	1.49	0.10	0.21	0.00030	0.00010	68,427	394	21.76	3.63	419	1,975
October 2012	0.40	26.48	24.43	3.96	4.64	3.79	1.53	0.06	0.21	0.00029	0.00010	70,312	30	22.35	3.72	56	1,654
November 2012	1.66	24.26	11.67	3.48	4.17	3.42	1.36	0.05	0.13	0.00035	0.00009	61,595	1,629	19.64	3.28	1,652	3,057
December 2012	6.36	32.92	23.52	4.29	5.09	4.17	1.67	0.31	0.20	0.00037	0.00011	76,145	1,062	24.24	4.04	1,090	2,824

[a] Monthly emissions from 2008 - 2012 based on monthly CEMS average (see Table 4-3). SO2 from fuel oil burned during startup not captured by CEMS and so was calculated seperately from CEMS.

[b] PM emissions represent only filterable particulate matter. PM_{10} and $PM_{2.5}$ emissions represent the sum of the filterable and condensable particulate matter.

[c] GHG = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O on a mass basis. CO_2e = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O using global warming potentials (GWP).
GWP: CO_2 = 1, CH_4 = 21, and N_2O = 310. GHG = $CO_2 + CH_4 + N_2O$, $CO_2e = CO_2 + 21*CH_4 + 310*N_2O$.

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Table 4-6: Summary of Baseline 12-Month Actual Emissions, No. 4 Recovery Boiler

Month Range	Pollutant Emission Rate (TPY)												
	SO_2	NO_x	CO	PM [a]	PM_{10} [a]	$PM_{2.5}$ [a]	VOC	SAM	TRS	Lead	Mercury	GHGs	CO_2e
March 2003 - February 2004	33.83	434.90	1,020.28	95.43	92.13	71.61	15.57	2.13	7.95	0.00395	0.00130	4,300	25,079
April 2003 - March 2004	33.39	434.02	1,018.69	95.28	91.98	71.49	15.54	2.11	7.94	0.00394	0.00130	4,183	24,930
May 2003 - April 2004	33.29	423.11	992.13	92.79	89.59	69.64	15.14	2.09	7.73	0.00385	0.00126	4,297	24,502
June 2003 - May 2004	40.43	433.40	1,008.13	94.27	91.13	70.86	15.40	2.41	7.85	0.00403	0.00129	6,281	26,811
July 2003 - June 2004	40.37	438.07	1,019.63	95.35	92.16	71.66	15.57	2.42	7.94	0.00407	0.00130	6,205	26,969
August 2003 - July 2004	42.63	436.32	1,012.47	94.67	91.55	71.19	15.47	2.51	7.88	0.00408	0.00130	6,897	27,515
September 2003 - August 2004	40.91	436.75	1,015.70	94.98	91.81	71.39	15.51	2.44	7.91	0.00406	0.00130	6,384	27,069
October 2003 - September 2004	45.12	433.45	1,002.24	93.70	90.66	70.51	15.32	2.62	7.80	0.00409	0.00129	7,674	28,083
November 2003 - October 2004	45.80	434.76	1,004.58	93.92	90.88	70.69	15.36	2.65	7.82	0.00411	0.00129	7,860	28,317
December 2003 - November 2004	46.58	437.09	1,009.26	94.36	91.31	71.02	15.43	2.69	7.86	0.00414	0.00130	8,062	28,614
January 2004 - December 2004	46.84	442.35	1,021.79	95.53	92.44	71.90	15.62	2.71	7.96	0.00419	0.00132	8,072	28,879
February 2004 - January 2005	49.02	441.19	1,014.48	94.83	91.83	71.44	15.52	2.80	7.90	0.00422	0.00131	9,122	29,779
March 2004 - February 2005	49.18	440.59	1,012.46	94.64	91.65	71.31	15.49	2.80	7.88	0.00422	0.00131	9,261	29,877
April 2004 - March 2005	55.01	443.46	1,009.07	94.29	91.46	71.18	15.46	3.06	7.85	0.00435	0.00132	11,627	32,172
May 2004 - April 2005	59.71	451.73	1,020.63	95.35	92.59	72.09	15.65	3.28	7.94	0.00451	0.00134	13,525	34,304
June 2004 - May 2005	55.28	452.18	1,025.04	95.76	92.94	72.35	15.71	3.08	7.97	0.00448	0.00134	12,754	33,623
July 2004 - June 2005	53.49	452.05	1,026.76	95.93	93.08	72.45	15.73	3.00	7.99	0.00446	0.00134	12,286	33,191
August 2004 - July 2005	51.49	454.16	1,034.36	96.65	93.73	72.95	15.84	2.92	8.05	0.00445	0.00135	11,690	32,750
September 2004 - August 2005	52.71	454.18	1,032.17	96.44	93.56	72.83	15.81	2.97	8.03	0.00447	0.00135	12,211	33,226
October 2004 - September 2005	49.92	458.10	1,044.54	97.60	94.64	73.66	15.99	2.86	8.13	0.00448	0.00136	11,512	32,780
November 2004 - October 2005	50.41	458.02	1,043.10	97.46	94.52	73.57	15.97	2.88	8.12	0.00449	0.00136	11,807	33,045
December 2004 - November 2005	49.83	458.87	1,045.27	97.66	94.72	73.72	16.01	2.85	8.13	0.00449	0.00136	11,770	33,052
January 2005 - December 2005	51.58	458.36	1,040.35	97.19	94.31	73.42	15.94	2.93	8.09	0.00453	0.00136	12,630	33,811
February 2005 - January 2006	50.35	460.42	1,047.65	97.88	94.95	73.90	16.05	2.88	8.15	0.00452	0.00137	12,079	33,409
March 2005 - February 2006	55.55	463.23	1,045.55	97.66	94.85	73.85	16.03	3.11	8.13	0.00464	0.00137	14,120	35,406
April 2005 - March 2006	50.15	460.85	1,049.21	98.03	95.08	74.00	16.07	2.87	8.16	0.00452	0.00137	11,956	33,318
May 2005 - April 2006	45.48	461.38	1,058.77	98.95	95.85	74.58	16.20	2.67	8.24	0.00444	0.00137	10,036	31,595
June 2005 - May 2006	44.91	459.78	1,055.91	98.68	95.59	74.37	16.15	2.64	8.22	0.00441	0.00137	9,811	31,311
July 2005 - June 2006	48.83	459.65	1,048.79	98.00	95.02	73.95	16.06	2.81	8.16	0.00448	0.00136	11,387	32,742
August 2005 - July 2006	53.14	461.48	1,045.80	97.70	94.83	73.82	16.03	3.00	8.14	0.00458	0.00137	13,091	34,383
September 2005 - August 2006	52.73	458.89	1,040.16	97.17	94.31	73.42	15.94	2.98	8.09	0.00455	0.00136	12,964	34,141
October 2005 - September 2006	52.27	459.47	1,042.42	97.38	94.51	73.57	15.97	2.96	8.11	0.00454	0.00136	12,762	33,986
November 2005 - October 2006	53.39	461.79	1,046.22	97.73	94.87	73.85	16.03	3.01	8.14	0.00458	0.00137	13,165	34,465
December 2005 - November 2006	53.79	462.33	1,046.91	97.80	94.94	73.91	16.05	3.03	8.14	0.00459	0.00137	13,307	34,621
January 2006 - December 2006	51.43	463.93	1,055.02	98.57	95.62	74.43	16.16	2.93	8.21	0.00456	0.00138	12,311	33,791
February 2006 - January 2007	49.91	463.18	1,075.52	94.55	92.76	72.43	16.58	2.86	7.82	0.00456	0.00138	12,311	33,791
March 2006 - February 2007	48.17	461.51	1,091.26	90.94	90.13	70.58	16.91	2.78	7.48	0.00455	0.00137	12,159	33,602
April 2006 - March 2007	52.46	464.36	1,110.18	86.83	87.30	68.63	17.32	2.96	7.09	0.00468	0.00138	14,438	35,851
May 2006 - April 2007	55.54	467.43	1,130.30	83.29	84.90	66.99	17.74	3.10	6.75	0.00479	0.00139	16,171	37,613
June 2006 - May 2007	53.23	483.09	1,192.70	83.19	85.77	67.89	18.79	3.02	6.69	0.00490	0.00144	15,558	37,852
July 2006 - June 2007	50.28	484.71	1,221.15	80.03	83.68	66.47	19.32	2.89	6.38	0.00489	0.00145	14,928	37,392
August 2006 - July 2007	44.48	454.10	1,161.40	72.75	76.87	61.22	18.43	2.59	5.76	0.00456	0.00136	13,321	34,449
September 2006 - August 2007	42.98	442.93	1,149.60	67.69	72.66	58.11	18.32	2.51	5.30	0.00447	0.00133	13,314	33,923
October 2006 - September 2007	45.65	444.18	1,167.08	63.56	69.75	56.08	18.70	2.62	4.91	0.00456	0.00133	14,953	35,511
November 2006 - October 2007	46.18	444.04	1,185.83	59.26	66.68	53.94	19.10	2.64	4.50	0.00460	0.00133	15,784	36,298
December 2006 - November 2007	44.73	443.13	1,205.31	55.30	63.84	51.95	19.50	2.57	4.12	0.00460	0.00133	15,795	36,298
January 2007 - December 2007	46.00	443.98	1,225.20	51.12	60.90	49.91	19.92	2.62	3.72	0.00466	0.00133	16,901	37,383
February 2007 - January 2008	43.71	442.83	1,214.56	51.39	61.26	50.21	20.04	2.54	4.32	0.00471	0.00134	17,449	38,043
March 2007 - February 2008	40.94	441.38	1,211.20	51.93	61.82	50.66	20.23	2.38	4.85	0.00469	0.00135	16,371	37,177
April 2007 - March 2008	34.47	436.62	1,199.47	52.18	62.02	50.80	20.32	2.11	5.42	0.00460	0.00135	14,619	35,526
May 2007 - April 2008	29.60	432.74	1,192.79	52.27	62.14	50.90	20.35	1.89	5.66	0.00462	0.00135	14,897	35,839
June 2007 - May 2008	31.58	426.15	1,182.10	52.26	62.19	50.96	20.36	1.91	5.74	0.00469	0.00136	16,053	36,993
July 2007 - June 2008	31.91	420.14	1,154.66	52.22	62.22	50.99	20.35	1.87	5.79	0.00477	0.00136	17,397	38,319
August 2007 - July 2008	31.49	444.67	1,261.08	55.93	66.64	54.62	21.80	1.91	6.18	0.00511	0.00146	18,728	41,137
September 2007 - August 2008	33.71	457.17	1,296.00	57.11	68.28	56.00	22.30	1.97	6.31	0.00546	0.00151	23,121	46,007
October 2007 - September 2008	36.67	453.17	1,283.47	57.11	68.34	56.06	22.31	1.97	6.25	0.00553	0.00151	24,244	47,130
November 2007 - October 2008	37.20	435.35	1,219.44	55.33	66.19	54.29	21.61	1.89	6.09	0.00533	0.00146	23,050	45,223
December 2007 - November 2008	35.55	435.82	1,197.77	55.09	66.17	54.33	21.56	1.82	5.98	0.00559	0.00148	27,688	49,769
January 2008 - December 2008	37.81	420.64	1,117.44	53.41	64.36	52.87	20.93	1.81	5.88	0.00564	0.00145	30,382	51,793
February 2008 - January 2009	44.50	412.55	1,069.83	51.59	62.54	51.44	20.27	1.97	5.34	0.00584	0.00143	35,917	56,602
March 2008 - February 2009	61.11	403.81	1,013.25	50.00	60.76	50.01	19.67	2.40	4.80	0.00582	0.00140	37,426	57,475
April 2008 - March 2009	67.85	400.12	951.52	49.23	59.92	49.33	19.38	2.57	4.23	0.00583	0.00138	38,577	58,317
May 2008 - April 2009	67.77	397.27	913.47	48.35	59.12	48.72	19.08	2.55	3.97	0.00601	0.00138	42,605	61,996
June 2008 - May 2009	63.09	387.91	838.05	47.04	57.56	47.45	18.57	2.41	3.77	0.00591	0.00135	42,389	61,254
July 2008 - June 2009	69.76	378.60	778.12	45.37	55.65	45.89	17.93	2.56	3.67	0.00583	0.00131	43,074	61,271
August 2008 - July 2009	69.84	371.61	689.80	44.50	54.59	45.02	17.59	2.55	3.51	0.00572	0.00128	42,228	60,078
September 2008 - August 2009	68.98	365.28	621.68	43.68	53.72	44.33	17.28	2.52	3.48	0.00576	0.00127	43,955	61,477
October 2008 - September 2009	60.81	359.41	585.43	43.34	53.22	43.90	17.13	2.29	3.52	0.00564	0.00125	42,273	59,655
November 2008 - October 2009	55.91	368.47	624.42	45.12	55.35	45.65	17.83	2.18	3.72	0.00581	0.00130	43,059	61,154
December 2008 - November 2009	67.67	368.89	637.77	45.34	55.41	45.66	17.88	2.51	4.06	0.00561	0.00129	39,489	57,670
January 2009 - December 2009	65.20	378.93	682.19	46.66	56.82	46.79	18.37	2.46	4.43	0.00557	0.00131	37,198	55,904
February 2009 - January 2010	67.84	377.85	687.33	46.54	56.58	46.57	18.31	2.49	4.51	0.00545	0.00130	35,424	54,081
March 2009 - February 2010	63.34	373.03	676.82	45.77	55.62	45.78	18.01	2.60	4.40	0.00533	0.00128	34,386	52,736
April 2009 - March 2010	61.61	377.79	699.18	46.52	56.50	46.50	18.30	2.64	4.50	0.00539	0.00130	34,368	53,020
May 2009 - April 2010	61.95	380.08	711.74	47.56	57.45	47.22	18.66	2.67	4.62	0.00518	0.00130	29,641	48,704
June 2009 - May 2010	70.66	392.47	751.77	48.24	58.36	47.99	18.94	3.03	4.74	0.00534	0.00133	31,562	50,900
July 2009 - June 2010	60.60	399.75	786.52	49.56	59.79	49.14	19.43	2.77	4.81	0.00531	0.00135	29,522	49,389
August 2009 - July 2010	64.10	405.72	810.71	49.86	60.15	49.43	19.55	2.92	4.87	0.00534	0.00136	29,689	49,673
September 2009 - August 2010	61.66	406.82	860.36	51.07	61.26	50.28	19.97	2.86	4.85	0.00510	0.00137	24,285	44,752
October 2009 - September 2010	61.48	408.21	852.47	51.34	61.60	50.56	20.08	2.85	4.79	0.00514	0.00137	24,574	45,150
November 2009 - October 2010	62.15	405.69	800.75	50.69	60.89	49.99	19.83	2.83	4.61	0.00515	0.00136	25,561	45,878
December 2009 - November 2010	50.25	395.60	758.11	50.13	60.18	49.40	19.61	2.49	4.23	0.00505	0.00134	24,542	44,635
January 2010 - December 2010	66.62	394.12	723.12	49.29	59.33	48.73	19.31	3.15	3.93	0.00513	0.00133	26,882	46,640
February 2010 - January 2011	58.62	395.86	723.62	50.17	60.18	49.40	19.62	2.98	3.74	0.00501	0.00134	23,791	43,913
March 2010 - February 2011	64.95	394.12	744.35	50.07	60.08	49.32	19.58	3.26	3.79	0.00502	0.00134	24,153	44,241
April 2010 - March 2011	61.62	388.75	750.56	49.56	59.52	48.86	19.39	3.09	3.79	0.00502	0.00133	24,785	44,682
May 2010 - April 2011	65.15	385.22	772.18	49.18	59.10	48.52	19.25	3.23	4.56	0.00502	0.00132	25,090	44,853
June 2010 - May 2011	65.14	381.99	764.98	49.03	58.85	48.31	19.18	3.25	4.64	0.00494	0.00131	23,997	43,710
July 2010 - June 2011	70.50	380.88	785.43	49.01	58.83	48.29	19.17	3.47	4.75	0.00493	0.00131	23,940	43,661
August 2010 - July 2011	67.35	376.91	781.41	48.90	58.67	48.15	19.12	3.31	4.42	0.00490	0.00131	23,434	43,125
September 2010 - August 2011	72.61	374.13	754.26	48.29	58.00	47.62	18.89	3.52	4.25	0.00490	0.00130	24,243	43,704
October 2010 - September 2011	77.56	368.68	750.91	47.89	57.48	47.18	18.73	3.51	4.32	0.00481	0.00128	23,244	42,560
November 2010 - October 2011	91.02	367.11	766.78	48.01	57.60	47.27	18.77	3.52	4.47	0.00480	0.00128	22,908	42,286
December 2010 - November 2011	102.82	367.77	742.58	47.48	57.12	46.91	18.59	3.95	4.57	0.00491	0.00128	25,376	44,557
January 2011 - December 2011	84.64	363.84	770.79	47.41	57.10	46.90	18.57	3.23	4.58	0.00497	0.00128	26,460	45,625
February 2011 - January 2012	96.83	362.95	753.56	46.82	56.46	46.39	18.35	3.76	4.47	0.00499	0.00127	27,446	46,372
March 2011 - February 2012	82.09	372.23	775.83	48.63	58.55	48.09	19.05	3.13	4.47	0.00508	0.00132	26,790	46,449
April 2011 - March 2012	87.96	369.27	776.95	48.29	58.07	47.69	18.90	3.41	4.26	0.00497	0.00130	25,411	44,932
May 2011 - April 2012	84.13	346.35	695.95	45.32	54.47	44.73	17.74	3.22	3.12	0.00465	0.00122	23,581	41,898
June 2011 - May 2012	87.97	337.68	680.18	44.46	53.39	43.84	17.39	3.40	2.83	0.00451	0.00119	22,321	40,290
July 2011 - June 2012	84.75	334.87	632.54	43.94	52.76	43.31	17.19	3.27	2.60	0.00445	0.00118	21,811	39,572
August 2011 - July 2012	87.40	332.37	596.56	43.66	52.46	43.07	17.08	3.41	2.73	0.00445	0.00117	22,154	39,802
September 2011 - August 2012	83.46	329.26	559.10	43.54	52.21	42.85	17.02	3.25	2.78	0.00433	0.00116	20,369	37,966
October 2011 - September 2012	79.38	329.14	532.04	43.22	51.81	42.51	16.89	3.28	2.65	0.00428	0.00115	19,937	37,404
November 2011 - October 2012	65.13	325.73	500.40	42.82	51.23	42.02	16.72	3.28	2.50	0.00413	0.00113	17,941	35,246
December 2011 - November 2012	54.68	319.54	475.52	42.74	51.04	41.85	16.67	2.83	2.32	0.00403	0.00112	16,358	33,629
January 2012 - December 2012	59.30	321.20	425.07	43.43	51.62	42.29	16.91	3.03	2.21	0.00383	0.00112	12,255	29,805

[a] PM emissions represent only filterable particulate matter. PM_{10} and $PM_{2.5}$ emissions represent the sum of the filterable and condensable particulate matter.

Table 4-7: Summary of Baseline Actual 24-Month Annual Average Emissions (March 2003 - December 2012), No. 4 Recovery Boiler

Month Range	Annual Average BLS Throughput (TPY)	Pollutant Emission Rate (TPY)												
		SO_2	NO_x	CO	PM [a]	PM_{10} [a]	$PM_{2.5}$ [a]	VOC	SAM	TRS	Lead	Mercury	GHGs	CO_2e
Mar 03 - Feb 05	753,859	41.51	437.75	1,016.37	95.03	91.89	71.46	15.53	2.47	7.92	0.00409	0.00130	6,780	27,478
Apr 03 - Mar 05	751,844	44.20	438.74	1,013.88	94.79	91.72	71.34	15.50	2.58	7.89	0.00415	0.00131	7,905	28,551
May 03 - Apr 05	746,123	46.50	437.42	1,006.38	94.07	91.09	70.86	15.39	2.68	7.83	0.00418	0.00130	8,911	29,403
Jun 03 - May 05	753,612	47.86	442.79	1,016.59	95.02	92.04	71.61	15.55	2.75	7.91	0.00425	0.00132	9,517	30,217
Jul 03 - Jun 05	758,562	46.93	445.06	1,023.20	95.64	92.62	72.06	15.65	2.71	7.96	0.00426	0.00132	9,245	30,080
Aug 03 - Jul 05	758,717	47.06	445.24	1,023.42	95.66	92.64	72.07	15.65	2.72	7.97	0.00427	0.00132	9,293	30,133
Sep 03 - Aug 05	759,105	46.81	445.47	1,023.94	95.71	92.69	72.11	15.66	2.71	7.97	0.00427	0.00132	9,297	30,147
Oct 03 - Sep 05	758,655	47.52	445.77	1,023.39	95.65	92.65	72.09	15.66	2.74	7.97	0.00428	0.00132	9,593	30,432
Nov 03 - Oct 05	758,949	48.11	446.39	1,023.84	95.69	92.70	72.13	15.67	2.76	7.97	0.00430	0.00133	9,834	30,681
Dec 03 - Nov 05	761,484	48.20	447.98	1,027.27	96.01	93.01	72.37	15.72	2.77	8.00	0.00432	0.00133	9,916	30,833
Jan 04 - Dec 05	764,243	49.21	450.36	1,031.07	96.36	93.38	72.66	15.78	2.82	8.02	0.00436	0.00134	10,351	31,345
Feb 04 - Jan 06	764,205	49.68	450.81	1,031.07	96.36	93.39	72.67	15.78	2.84	8.02	0.00437	0.00134	10,601	31,594
Mar 04 - Feb 06	762,511	52.37	451.91	1,029.01	96.15	93.25	72.58	15.76	2.96	8.01	0.00443	0.00134	11,690	32,641
Apr 04 - Mar 06	762,596	52.58	452.15	1,029.14	96.16	93.27	72.59	15.76	2.96	8.01	0.00444	0.00134	11,791	32,745
May 04 - Apr 06	770,442	52.59	456.56	1,039.70	97.15	94.22	73.33	15.92	2.97	8.09	0.00447	0.00135	11,781	32,949
Jun 04 - May 06	771,090	50.10	455.98	1,040.47	97.22	94.27	73.36	15.93	2.86	8.10	0.00445	0.00135	11,282	32,467
Jul 04 - Jun 06	769,005	51.16	455.85	1,037.78	96.96	94.05	73.20	15.89	2.91	8.07	0.00447	0.00135	11,837	32,966
Aug 04 - Jul 06	770,632	52.31	457.82	1,040.08	97.17	94.28	73.39	15.93	2.96	8.09	0.00451	0.00136	12,390	33,566
Sep 04 - Aug 06	767,695	52.72	456.53	1,036.17	96.80	93.94	73.12	15.88	2.98	8.06	0.00451	0.00135	12,587	33,683
Oct 04 - Sep 06	773,195	51.10	458.78	1,043.48	97.49	94.57	73.61	15.98	2.91	8.12	0.00451	0.00136	12,137	33,383
Nov 04 - Oct 06	774,016	51.90	459.90	1,044.66	97.60	94.70	73.71	16.00	2.94	8.13	0.00453	0.00136	12,486	33,755
Dec 04 - Nov 06	775,074	51.81	460.60	1,046.09	97.73	94.83	73.81	16.03	2.94	8.14	0.00454	0.00137	12,538	33,837
Jan 05 - Dec 06	776,267	51.50	461.14	1,047.68	97.88	94.97	73.92	16.05	2.93	8.15	0.00454	0.00137	12,470	33,801
Feb 05 - Jan 07	779,011	50.13	461.80	1,061.59	96.22	93.85	73.16	16.31	2.87	7.99	0.00454	0.00137	12,195	33,600
Mar 05 - Feb 07	777,408	51.86	462.37	1,068.41	94.30	92.49	72.22	16.47	2.94	7.81	0.00459	0.00137	13,140	34,504
Apr 05 - Mar 07	778,268	51.31	462.60	1,079.70	92.43	91.19	71.32	16.69	2.92	7.63	0.00460	0.00137	13,197	34,585
May 05 - Apr 07	782,369	50.51	464.41	1,094.53	91.12	90.38	70.79	16.97	2.88	7.49	0.00461	0.00138	13,104	34,604
Jun 05 - May 07	796,900	49.07	471.44	1,124.31	90.94	90.68	71.13	17.47	2.83	7.45	0.00466	0.00140	12,684	34,582
Jul 05 - Jun 07	797,267	49.55	472.18	1,134.97	89.02	89.35	70.21	17.69	2.85	7.27	0.00469	0.00141	13,158	35,067
Aug 05 - Jul 07	771,761	48.81	457.79	1,103.60	85.22	85.85	67.52	17.23	2.80	6.95	0.00457	0.00136	13,206	34,416
Sep 05 - Aug 07	760,217	47.85	450.91	1,094.88	82.43	83.49	65.76	17.13	2.74	6.70	0.00451	0.00134	13,139	34,032
Oct 05 - Sep 07	760,059	48.96	451.83	1,104.75	80.47	82.13	64.83	17.34	2.79	6.51	0.00455	0.00135	13,858	34,748
Nov 05 - Oct 07	760,578	49.79	452.91	1,116.02	78.50	80.77	63.90	17.57	2.83	6.32	0.00459	0.00135	14,475	35,382
Dec 05 - Nov 07	760,631	49.26	452.73	1,126.11	76.55	79.39	62.93	17.77	2.80	6.13	0.00459	0.00135	14,551	35,460
Jan 06 - Dec 07	763,274	48.71	453.95	1,140.11	74.84	78.26	62.17	18.04	2.78	5.97	0.00461	0.00135	14,606	35,587
Feb 06 - Jan 08	765,258	46.81	453.01	1,145.04	72.97	77.01	61.32	18.31	2.70	6.07	0.00464	0.00136	14,880	35,917
Mar 06 - Feb 08	768,532	44.55	451.44	1,151.23	71.44	75.98	60.62	18.57	2.58	6.16	0.00462	0.00136	14,265	35,390
Apr 06 - Mar 08	769,803	43.47	450.49	1,154.83	69.51	74.66	59.71	18.82	2.54	6.26	0.00464	0.00137	14,529	35,689
May 06 - Apr 08	770,831	42.57	450.08	1,161.54	67.78	73.52	58.95	19.04	2.50	6.20	0.00470	0.00137	15,534	36,726
Jun 06 - May 08	786,307	42.40	454.62	1,187.40	67.73	73.98	59.42	19.57	2.46	6.22	0.00480	0.00140	15,805	37,422
Jul 06 - Jun 08	789,030	41.09	452.42	1,187.91	66.12	72.95	58.73	19.84	2.38	6.08	0.00483	0.00141	16,162	37,855
Aug 06 - Jul 08	791,789	37.99	449.38	1,211.24	64.34	71.75	57.92	20.11	2.25	5.97	0.00484	0.00141	16,025	37,793
Sep 06 - Aug 08	790,758	38.34	450.05	1,222.80	62.40	70.47	57.05	20.31	2.24	5.81	0.00496	0.00142	18,218	39,965
Oct 06 - Sep 08	789,685	41.16	448.68	1,225.28	60.33	69.05	56.07	20.50	2.30	5.58	0.00504	0.00142	19,599	41,321
Nov 06 - Oct 08	775,901	41.69	439.70	1,202.63	57.30	66.44	54.12	20.36	2.27	5.29	0.00497	0.00140	19,417	40,761
Dec 06 - Nov 08	773,756	40.14	439.48	1,201.54	55.20	65.01	53.14	20.53	2.20	5.05	0.00510	0.00140	21,741	43,034
Jan 07 - Dec 08	760,930	41.90	432.31	1,171.32	52.26	62.63	51.39	20.43	2.22	4.80	0.00515	0.00139	23,641	44,588
Feb 07 - Jan 09	749,352	44.11	427.69	1,142.19	51.49	61.90	50.82	20.15	2.25	4.83	0.00528	0.00139	26,683	47,322
Mar 07 - Feb 09	741,624	51.02	422.59	1,112.23	50.96	61.29	50.33	19.95	2.39	4.82	0.00525	0.00137	26,898	47,326
Apr 07 - Mar 09	737,865	51.16	418.37	1,075.49	50.71	60.97	50.07	19.85	2.34	4.83	0.00522	0.00137	26,598	46,922
May 07 - Apr 09	731,865	48.69	415.00	1,053.13	50.31	60.63	49.81	19.71	2.22	4.81	0.00532	0.00137	28,751	48,918
Jun 07 - May 09	722,185	47.33	407.03	1,010.08	49.65	59.88	49.20	19.46	2.16	4.76	0.00530	0.00135	29,221	49,123
Jul 07 - Jun 09	709,578	50.83	399.37	966.39	48.79	58.93	48.44	19.14	2.22	4.73	0.00530	0.00134	30,235	49,795
Aug 07 - Jul 09	730,317	50.67	408.14	975.44	50.22	60.61	49.82	19.69	2.23	4.85	0.00542	0.00137	30,478	50,607
Sep 07 - Aug 09	732,663	51.34	411.22	958.84	50.40	61.00	50.16	19.79	2.25	4.90	0.00561	0.00139	33,538	53,742
Oct 07 - Sep 09	730,143	48.74	406.29	934.45	50.22	60.78	49.98	19.72	2.13	4.88	0.00558	0.00138	33,259	53,392
Nov 07 - Oct 09	730,189	46.55	401.91	921.93	50.22	60.77	49.97	19.72	2.04	4.90	0.00557	0.00138	33,054	53,189
Dec 07 - Nov 09	730,017	51.61	402.36	917.77	50.22	60.79	49.99	19.72	2.16	5.02	0.00560	0.00139	33,588	53,720
Jan 08 - Dec 09	727,343	51.50	399.78	899.82	50.04	60.59	49.83	19.65	2.13	5.16	0.00560	0.00138	33,790	53,849
Feb 08 - Jan 10	712,981	56.17	395.20	878.58	49.06	59.56	49.01	19.29	2.23	4.93	0.00565	0.00137	35,671	55,341
Mar 08 - Feb 10	695,775	62.22	388.42	845.04	47.89	58.19	47.89	18.84	2.50	4.60	0.00558	0.00134	35,906	55,106
Apr 08 - Mar 10	695,581	64.73	388.96	825.35	47.88	58.21	47.92	18.84	2.61	4.36	0.00561	0.00134	36,472	55,668
May 08 - Apr 10	696,728	64.86	388.67	812.60	47.95	58.28	47.97	18.87	2.61	4.29	0.00559	0.00134	36,123	55,350
Jun 08 - May 10	692,071	66.87	390.19	794.91	47.64	57.96	47.72	18.75	2.72	4.26	0.00562	0.00134	36,975	56,077
Jul 08 - Jun 10	689,618	65.18	389.18	782.32	47.47	57.72	47.51	18.68	2.66	4.24	0.00557	0.00133	36,298	55,330
Aug 08 - Jul 10	685,456	66.97	388.67	750.26	47.18	57.37	47.22	18.57	2.73	4.19	0.00553	0.00132	35,959	54,876
Sep 08 - Aug 10	688,494	65.32	386.05	741.02	47.38	57.49	47.30	18.63	2.69	4.16	0.00543	0.00132	34,120	53,114
Oct 08 - Sep 10	688,014	61.14	383.81	718.95	47.34	57.41	47.23	18.61	2.57	4.16	0.00539	0.00131	33,424	52,402
Nov 08 - Oct 10	696,203	59.03	387.08	712.59	47.91	58.12	47.82	18.83	2.50	4.17	0.00548	0.00133	34,310	53,516
Dec 08 - Nov 10	693,945	58.96	382.25	697.94	47.74	57.79	47.53	18.75	2.50	4.15	0.00533	0.00132	32,016	51,153
Jan 09 - Dec 10	697,417	65.91	386.52	702.66	47.97	58.07	47.76	18.84	2.81	4.18	0.00535	0.00132	32,040	51,272
Feb 09 - Jan 11	703,199	63.23	386.85	705.47	48.36	58.38	47.98	18.97	2.74	4.13	0.00523	0.00132	29,608	48,997
Mar 09 - Feb 11	696,887	64.14	383.57	710.58	47.92	57.85	47.55	18.79	2.93	4.10	0.00518	0.00131	29,269	48,488
Apr 09 - Mar 11	698,592	61.62	383.27	724.87	48.04	58.01	47.68	18.84	2.87	4.14	0.00521	0.00131	29,576	48,851
May 09 - Apr 11	703,624	63.55	382.65	741.96	48.37	58.27	47.87	18.95	2.95	4.59	0.00510	0.00131	27,366	46,779
Jun 09 - May 11	707,461	67.90	387.23	758.38	48.64	58.61	48.15	19.06	3.14	4.69	0.00514	0.00132	27,779	47,305
Jul 09 - Jun 11	717,083	65.55	390.32	785.97	49.29	59.31	48.71	19.30	3.12	4.78	0.00512	0.00133	26,731	46,525
Aug 09 - Jul 11	718,401	65.72	391.31	796.06	49.38	59.41	48.79	19.33	3.11	4.64	0.00512	0.00133	26,562	46,399
Sep 09 - Aug 11	723,035	67.13	390.47	807.31	49.68	59.63	48.95	19.43	3.19	4.55	0.00500	0.00133	24,264	44,228
Oct 09 - Sep 11	722,165	69.52	388.44	801.69	49.62	59.54	48.87	19.40	3.18	4.56	0.00498	0.00133	23,909	43,855
Nov 09 - Oct 11	718,267	76.58	386.40	783.77	49.35	59.25	48.63	19.30	3.17	4.54	0.00498	0.00132	24,234	44,082
Dec 09 - Nov 11	710,257	76.53	381.69	750.34	48.81	58.65	48.15	19.10	3.22	4.40	0.00498	0.00131	24,959	44,596
Jan 10 - Dec 11	703,437	75.63	378.98	746.96	48.35	58.21	47.81	18.94	3.19	4.25	0.00505	0.00131	26,671	46,133
Feb 10 - Jan 12	705,649	77.73	379.41	738.59	48.50	58.32	47.89	18.98	3.37	4.10	0.00500	0.00131	25,618	45,143
Mar 10 - Feb 12	718,130	73.52	383.18	760.09	49.35	59.31	48.70	19.31	3.20	4.13	0.00505	0.00133	25,472	45,345
Apr 10 - Mar 12	711,941	74.79	379.01	763.75	48.93	58.79	48.27	19.15	3.25	4.02	0.00500	0.00132	25,098	44,807
May 10 - Apr 12	687,550	74.64	365.79	734.07	47.25	56.79	46.63	18.49	3.23	3.84	0.00483	0.00127	24,336	43,376
Jun 10 - May 12	680,248	76.55	359.83	722.58	46.74	56.12	46.07	18.28	3.32	3.73	0.00473	0.00125	23,159	42,000
Jul 10 - Jun 12	676,396	77.63	357.88	708.98	46.48	55.80	45.80	18.18	3.37	3.67	0.00469	0.00125	22,876	41,617
Aug 10 - Jul 12	673,536	77.37	354.64	688.98	46.28	55.56	45.61	18.10	3.36	3.57	0.00467	0.00124	22,794	41,463
Sep 10 - Aug 12	668,218	78.04	351.70	656.68	45.91	55.10	45.23	17.96	3.38	3.51	0.00462	0.00123	22,306	40,835
Oct 10 - Sep 12	663,043	78.47	348.91	641.47	45.55	54.64	44.85	17.81	3.40	3.49	0.00455	0.00122	21,590	39,982
Nov 10 - Oct 12	661,120	78.07	346.42	633.59	45.42	54.41	44.65	17.75	3.40	3.48	0.00447	0.00121	20,425	38,766
Dec 10 - Nov 12	656,611	78.75	343.66	609.05	45.11	54.08	44.38	17.63	3.39	3.45	0.00447	0.00120	20,867	39,093
Jan 11 - Dec 12	661,323	71.97	342.52	597.93	45.42	54.36	44.59	17.74	3.13	3.39	0.00440	0.00120	19,358	37,715
Highest Consecutive 24-Month Annual Average		**Dec 10 - Nov 12** 78.75	**Jul 05 - Jun 07** 472.18	**Oct 06 - Sep 08** 1,225.28	**Jan 05 - Dec 06** 97.88	**Jan 05 - Dec 06** 94.97	**Jan 05 - Dec 06** 73.92	**Dec 06 - Nov 08** 20.53	**Oct 10 - Sep 12** 3.40	**Jan 05 - Dec 06** 8.15	**Feb 08 - Jan 10** 0.00565	**Oct 06 - Sep 08** 0.00142	**Jun 08 - May 10** 36,975	**Jun 08 - May 10** 56,077

[a] PM emissions represent only filterable particulate matter. PM_{10} and $PM_{2.5}$ emissions represent the sum of the filterable and condensable particulate matter.

Table 4-8. Summary of Baseline Actual Emissions, No. 4 Recovery Boiler

Pollutant	Baseline Period	Hours of Operation in Baseline Period	Baseline BLS Throughput (TPY)	Baseline BLS Throughput (lb/hr)	Baseline Emission Rate (TPY) [a]	Effective Baseline Emission Factor [b]
Sulfur Dioxide - SO_2	Dec 10 - Nov 12	8,096	656,611	162,197	78.75	0.021 lb/MMBtu
Nitrogen Oxides - NO_x	Jul 05 - Jun 07	8,333	797,267	191,357	472.18	0.102 lb/MMBtu
Carbon Monoxide - CO	Oct 06 - Sep 08	8,327	789,685	189,680	1,225.28	0.268 lb/MMBtu
Particulate Matter Total - PM	Jan 05 - Dec 06	8,289	776,267	187,301	97.88	0.252 lb/ton BLS
Particulate Matter - PM_{10}	Jan 05 - Dec 06	8,289	776,267	187,301	94.97	0.245 lb/ton BLS
Particulate Matter - $PM_{2.5}$	Jan 05 - Dec 06	8,289	776,267	187,301	73.92	0.190 lb/ton BLS
Volatile Organic Compounds - VOC	Dec 06 - Nov 08	8,320	773,756	185,994	20.53	0.053 lb/ton BLS
Sulfuric Acid Mist - SAM	Oct 10 - Sep 12	8,115	663,043	163,404	3.40	0.010 lb/ton BLS
Total Reduced Sulfur - TRS	Jan 05 - Dec 06	8,289	776,267	187,301	8.15	0.021 lb/ton BLS
Lead - Pb	Feb 08 - Jan 10	8,201	712,981	173,887	0.00565	1.58E-05 lb/ton BLS
Mercury - Hg	Oct 06 - Sep 08	8,320	789,685	189,822	0.00142	3.60E-06 lb/ton BLS
Greenhouse Gases - GHGs	Jun 08 - May 10	8,201	692,071	168,787	36,975	--
Carbon Dioxide Equivalents - CO_2e	Jun 08 - May 10	8,201	692,071	168,787	56,077	--

Footnotes:

[a] PM emissions represent only filterable particulate matter. PM_{10} and $PM_{2.5}$ emissions represent the sum of the filterable and condensable particulate matter.

[b] The effective baseline emission factor is calculated by dividing the baseline emission rate by the baseline BLS throughput. It includes emissions from BLS and No. 6 fuel oil. An effective baseline emission factor in terms of lb/ton BLS is not calculated for GHGs as GHG emissions are more dependent on No. 6 fuel oil consumption.

Table 4-9: Projected Actual Annual Emissions for BLS burning, No. 4 Recovery Boiler

Pollutant	Fuel Amount Basis	Ref	Activity Factor [a]	Maximum Annual Emissions (TPY)
Sulfur Dioxide - SO_2				
- Black Liquor Solids	0.0074 lb/MMBtu	1	9,629,100 MMBtu/yr	35.44
Nitrogen Oxides - NO_x				
- Black Liquor Solids	0.0936 lb/MMBtu	1	9,629,100 MMBtu/yr	450.50
Carbon Monoxide - CO				
- Black Liquor Solids	0.2341 lb/MMBtu	1	9,629,100 MMBtu/yr	1,127.13
Particulate Matter Total - PM				
- Black Liquor Solids				
- Filterable	0.203 lb/ton BLS	2	823,000 tons BLS	83.68
- Condensable	-- --	--	-- --	--
			Total:	**83.68**
Particulate Matter - PM_{10}				
- Black Liquor Solids				
- Filterable	71.3 % of PM	3	823,000 tons BLS	59.67
- Condensable	0.063 lb/ton BLS	3	823,000 tons BLS	25.92
			Total:	**85.59**
Particulate Matter - $PM_{2.5}$				
- Black Liquor Solids				
- Filterable	49.8 % of PM	3	823,000 tons BLS	41.67
- Condensable	0.063 lb/ton BLS	3	823,000 tons BLS	25.92
			Total:	**67.60**
Volatile Organic Compounds - VOC				
- Black Liquor Solids	0.077 lb/ton BLS	2	823,000 tons BLS	31.59
Sulfuric Acid Mist - SAM				
- Black Liquor Solids	0.0027 lb/ton BLS	2	823,000 tons BLS	1.09
Total Reduced Sulfur - TRS				
- Black Liquor Solids	0.0147 lb/ton BLS	1	823,000 tons BLS	6.05
Lead - Pb				
- Black Liquor Solids	9.81E-06 lb/ton BLS	4	823,000 tons BLS	0.00404
Mercury - Hg				
- Black Liquor Solids	3.38E-06 lb/ton BLS	4	823,000 tons BLS	0.00139
Greenhouse Gases - GHGs				
Non-Biogenic Carbon Dioxide - CO_2				
- Black Liquor Solids	-- lb/ton BLS	--	-- tons BLS	--
Methane - CH_4				
- Black Liquor Solids	0.77 lb/ton BLS	5	823,000 tons BLS	318.43
Nitrous Oxide - N_2O				
- Black Liquor Solids	0.13 lb/ton BLS	5	823,000 tons BLS	53.07
			Total:	**371.50**
Carbon Dioxide Equivalents - CO_2e				
Non-Biogenic Carbon Dioxide - CO_2				
- Black Liquor Solids	1 ton CO_2e/ton CO_2	6	-- tons CO_2	--
Methane - CH_4				
- Black Liquor Solids	21 ton CO_2e/ton CH_4	6	318.43 tons CH_4	6,687
Nitrous Oxide - N_2O				
- Black Liquor Solids	310 ton CO_2e/ton N_2O	6	53.07 tons N_2O	16,452
				23,139

Footnotes:

[a] Activity factor based on the mill business projections for the next five years (823,000 TPY BLS; equivalent to 9,626,100 MMBtu based on BLS heat content of 5,850 Btu/lb from 2011 and 2012).

References:

1 Based on maximum 12-month rolling average average CEMS data (see Table 4-3).
2 Based on average stack test result from 2007 - 2012 plus one standard deviation (see Table 4-2).
3 NCASI Technical Bulletin No. 884, Table 4.12, median values. Filterable PM10 and PM2.5 emission factors are 71.3 percent and 49.8 percent of filterable PM emissions, respectively.
4 NCASI Technical Bulletin No. 973, Table 4.24, median values.
5 Greenhouse Gas Reporting Rule (40 CFR 98 Subpart AA - Pulp and Paper Manufacturing). Emission factors for North American softwood are 94.4 kg/MMBtu forCO_2, 0.030 kg/MMBtu for CH_4, and 0.005 kg/MMBtu for N_2O. BLS heat content is 5,768 Btu/lb based on mill records from 2008 - 2011.
6 GHG = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O on a mass basis. CO_2e = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O using global warming potentials (GWP). GWP: CO_2 = 1, CH_4 = 21, and N_2O = 310. GHG = CO_2 + CH_4 + N_2O, CO_2e = CO_2 + 21*CH_4 + 310*N_2O

Table 4-10: Projected Actual Annual Emissions for Auxiliary Fuel Burning, No. 4 Recovery Boiler

Pollutant	Emission Factor: Fuel Amount Basis	Emission Factor: Heat Input Basis	Ref	Activity Factor [a]: Heat Input Rate (MMBtu/yr)	Activity Factor [a]: Fuel Usage	Maximum Annual Emissions (TPY)
Sulfur Dioxide - SO_2						
Natural Gas Firing Alone	0.6 lb/10^6 ft^3	0.0006 lb/MMBtu	1	0	0.00 x 10^6 ft^3	0
Black Liquor Solids / Natural Gas Cofiring	-- --	0.0074 lb/MMBtu	3	1,178,220	1,178.22 x 10^6 ft^3	4.34
				1,178,220		**4.34**
Nitrogen Oxides - NO_x						
Natural Gas Firing Alone	150 lb/10^6 ft^3	0.1500 lb/MMBtu	2	83,000	83.00 x 10^6 ft^3	6.23
Black Liquor Solids / Natural Gas Cofiring	-- --	0.0936 lb/MMBtu	3	1,095,220	1,095.22 x 10^6 ft^3	51.24
				1,178,220		**57.47**
Carbon Monoxide - CO						
Natural Gas Firing Alone	84 lb/10^6 ft^3	0.0840 lb/MMBtu	2	0	0.00 x 10^6 ft^3	0
Black Liquor Solids / Natural Gas Cofiring	-- --	0.2341 lb/MMBtu	3	1,178,220	1,178.22 x 10^6 ft^3	137.92
				1,178,220		**137.92**
Particulate Matter Total - PM						
All Natural Gas Firing						
- Filterable	1.9 lb/10^6 ft^3	0.0019 lb/MMBtu	1	1,178,220	1,178.22 x 10^6 ft^3	1.12
- Condensable	-- --	-- --	--	--	-- --	--
				1,178,220		**1.12**
Particulate Matter - PM_{10}						
All Natural Gas Firing						
- Filterable	1.9 lb/10^6 ft^3	0.0019 lb/MMBtu	1	1,178,220	1,178.220 x 10^6 ft^3	1.12
- Condensable	5.7 lb/10^6 ft^3	0.0057 lb/MMBtu	1	1,178,220	1,178.22 x 10^6 ft^3	3.36
				1,178,220		**4.48**
Particulate Matter - $PM_{2.5}$						
All Natural Gas Firing						
- Filterable	1.9 lb/10^6 ft^3	0.0019 lb/MMBtu	1	1,178,220	1,178.22 x 10^6 ft^3	1.12
- Condensable	5.7 lb/10^6 ft^3	0.0057 lb/MMBtu	1	1,178,220	1,178.22 x 10^6 ft^3	3.36
				1,178,220		**4.48**
Volatile Organic Compounds - VOC						
All Natural Gas Firing	5.5 lb/10^6 ft^3	0.0055 lb/MMBtu	1	1,178,220	1,178.220 x 10^6 ft^3	3.24
Sulfuric Acid Mist - SAM						
All Natural Gas Firing	4.45 % of SO_2	2.67E-05 lb/MMBtu	4	1,178,220	1,178.220 x 10^6 ft^3	0.016
Total Reduced Sulfur - TRS						
All Natural Gas Firing	-- lb/10^6 ft^3	-- lb/MMBtu	--	1,178,220	1,178.22 x 10^6 ft^3	--
Lead - Pb						
All Natural Gas Firing	0.0005 lb/10^6 ft^3	5.00E-07 lb/MMBtu	1	1,178,220	1,178.22 x 10^6 ft^3	0.00029
Mercury - Hg						
All Natural Gas Firing	0.00026 lb/10^6 ft^3	2.60E-07 lb/MMBtu	5	1,178,220	1,178.22 x 10^6 ft^3	0.00015
Greenhouse Gases - GHGs						
All Natural Gas Firing						
- Non-Biogenic Carbon Dioxide - CO_2	116,889 lb/10^6 ft^3	116.89 lb/MMBtu	6	1,178,220	1,178.22 x 10^6 ft^3	68,860
- Methane - CH_4	2.20 lb/10^6 ft^3	0.0022 lb/MMBtu	6	1,178,220	1,178.22 x 10^6 ft^3	1.30
- Nitrous Oxide - N_2O	0.22 lb/10^6 ft^3	0.00022 lb/MMBtu	6	1,178,220	1,178.22 x 10^6 ft^3	0.13
						68,862
Carbon Dioxide Equivalents - CO_2e						
All Natural Gas Firing						
- Non-Biogenic Carbon Dioxide - CO_2	1 ton CO_2e/ton CO_2	-- --	7	--	68,860 tons CO_2	68,860
- Methane - CH_4	21 ton CO_2e/ton CH_4	-- --	7	--	1.30 tons CH_4	27
- Nitrous Oxide - N_2O	310 ton CO_2e/ton N_2O	-- --	7	--	0.13 tons N_2O	40
						68,928

Footnotes:

a Annual activity factor based on the projected heat input to the boiler of 9,629,100 MMBtu/yr from BLS burning (823,000 TPY and 5,850 Btu/lb; see Table 4-9) and the maximum permitted heat input rate to the boiler from fossil fuel firing of 10-percent of the total permitted annual heat input rate (1,178,220 MMBtu/yr). Total projected annual heat input rate (BLS plus fossil fuels) is 10,807,320 MMBtu/yr. Annual heat input during startup based on maximum 12-month rolling fuel oil usage during startup (498,900 gallons; 74,835 MMBtu; see Table 4-4) plus 10-percent (83,000 MMBtu/yr).

References:

1 AP-42, Table 1.4-2.

2 Based on emissions guarantees from burner vendor.

3 Based on maximum 12-month rolling average CEMS data (see Table 4-3).

4 Based on emission factor for SO_3 of 5.7(S) lb/10^3 gallons from AP-42, Table 1.3-1, where S is the sulfur content of the fuel oil. The ratio of SO_3 to SO_2 emissions (5.7/157) is multiplied by the ratio of molecular weights of SAM and SO_3 (98/80), resulting in a factor of approximately 4.45 percent of SO_2. Emissions are for fuel oil burned during startup.

5 AP-42, Table 1.4-4.

6 Greenhouse Gas Reporting Rule (40 CFR 98 Subpart C - General Stationary Fuel Combustion Sources). Emission factors for Natural Gas are 53.02 kg/MMBtu for CO_2, 0.001 kg/MMBtu for CH_4, and 0.0001 kg/MMBtu for N_2O. Natural Gas heat content is 1,000 MMBtu/10^6 ft^3.

7 GHG = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O on a mass basis. CO_2e = sum of emission rates of non-biogenic CO_2, CH_4, and N_2O using global warming potentials (GWP).

GWP: CO_2 = 1, CH_4 = 21, and N_2O = 310. GHG = CO_2 + CH_4 + N_2O, CO_2e = CO_2 + 21*CH_4 + 310*N_2O

Table 4-11. Summary of Projected Actual Emissions, No. 4 Recovery Boiler

Pollutant	Projected Actual Emission Rate (TPY) [a]	Effective Projected Actual Emission Factor [b]
Sulfur Dioxide - SO_2	39.78	0.007 lb/MMBtu
Nitrogen Oxides - NO_x	507.97	0.094 lb/MMBtu
Carbon Monoxide - CO	1,265.04	0.234 lb/MMBtu
Particulate Matter Total - PM	84.80	0.206 lb/ton BLS
Particulate Matter - PM_{10}	90.07	0.219 lb/ton BLS
Particulate Matter - $PM_{2.5}$	72.08	0.175 lb/ton BLS
Volatile Organic Compounds - VOC	34.83	0.085 lb/ton BLS
Sulfuric Acid Mist - SAM	1.11	0.003 lb/ton BLS
Total Reduced Sulfur - TRS	6.05	0.015 lb/ton BLS
Lead - Pb	0.00433	1.05E-05 lb/ton BLS
Mercury - Hg	0.00154	3.75E-06 lb/ton BLS
Greenhouse Gases - GHGs	69,233	--
Carbon Dioxide Equivalents - CO_2e	92,067	--

Footnotes:

[a] See Tables 4-9 and 4-10 for detailed calculations of projected actual emissions.

[b] Based on projected annual BLS burning rate of 823,000 TPY.

Table 4-12. PSD Applicability Analysis, No. 4 Recovery Boiler

Pollutant	BAE: Baseline Actual Emissions (TPY) [a]	PAE: Projected Actual Emissions (TPY) [b]	PAE - BAE: Emissions Increase (TPY) [c]	PSD Significant Emission Rate (TPY)	PSD Review Triggered? (Yes/No)
Sulfur Dioxide - SO_2	78.75	39.78	0	40	No
Nitrogen Oxides - NO_x	472.18	507.97	35.79	40	No
Carbon Monoxide - CO	1,225.28	1,265.04	39.77	100	No
Particulate Matter Total - PM	97.88	84.80	0	25	No
Particulate Matter - PM_{10}	94.97	90.07	0	15	No
Particulate Matter - $PM_{2.5}$	73.92	72.08	0	10	No
Volatile Organic Compounds - VOC	20.53	34.83	14.30	40	No
Sulfuric Acid Mist - SAM	3.40	1.11	0	7	No
Total Reduced Sulfur - TRS	8.15	6.05	0	10	No
Lead - Pb	0.00565	0.00433	0	0.6	No
Mercury - Hg	0.00142	0.00154	0.00012	0.1	No
Greenhouse Gases - GHGs	36,975	69,233	32,258	0	No
Carbon Dioxide Equivalents - CO_2e	56,077	92,067	35,990	75,000	

Footnotes:

[a] Baseline Actual Emissions (BAE) are calculated in Table 4-7 and summarized in Table 4-8.

[b] Projected Actual Emissions (PAE) are calculated in Tables 4-9 and 4-10 and summarized in Table 4-11.

[c] Calculated as the difference between PAE and BAE. If the increase is less than zero (a decrease), than the difference is set to zero.

APPENDIX A

REFERENCES FOR EMISSION FACTORS

Table 4.11 VOC[a], SO_2, NO_x, CO, TPM, CPM, PM_{10} and $PM_{2.5}$ Emissions from DCE Kraft Recovery Furnaces

	No.[b]	Range	Median	Mean
		lb/ton BLS		
VOC[a]	12	0.01 – 1.50	0.21	0.39
SO_2	7	1.10 - 3.58	2.29	2.12
NO_x[c]	1	--	1.09	1.09
CO[d]	19	0.10 - 6.88	1.21	2.20
TPM[e]	23	0.07 – 2.58	0.70	0.74
CPM[f]	2	0.21 – 0.68	0.44	0.44
PM_{10}[g]	4		76.8%	75.0%
$PM_{2.5}$[g]	4		53.4%	52.9%

[a] measured as C using EPA Method 25 or 25A; [b] number of furnaces tested; [c] a 1992 EPA Survey Questionnaire yielded average NO_x emissions from 16 DCE furnaces of about 57.4 ppm @ 8% O_2 (range 30 to 110) or about 1.20 lb/t bls (range 0.63 to 2.30); [d] same for DCE and NDCE furnaces; [e] total (filterable) particulate matter; [f]C CPM (condensible particulate matter); [g] PM_{10} & $PM_{2.5}$ as determined using EPA Draft Method for determining PM_{10} & $PM_{2.5}$ - expressed as % of TPM

Table 4.12 provides estimates of emissions for VOC, SO_2, NO_x, CO, total PM (TPM), condensible particulate emissions (CPM), PM_{10}, and $PM_{2.5}$ from NDCE kraft recovery furnaces. Detailed data including descriptions for each furnace are provided in Appendix A, Tables A12a, A12b, A12c, A12d, and A11b. Note that Table A11b combines data for CO emissions from both DCE and NDCE recovery furnaces as the direct contact evaporator is generally not expected to influence CO emissions from a kraft recovery furnace.

Table 4.12 VOC[a], SO_2, NO_x, CO, TPM, CPM, PM_{10} and $PM_{2.5}$ Emissions from NDCE Kraft Recovery Furnaces

	No.[b]	Range	Median	Mean
		lb/ton BLS		
VOC[a]	19	ND – 1.07	0.09	0.15
SO_2	46	0.00 – 5.36	0.22	0.74
NO_x	28	0.64 – 3.19	1.50	1.52
CO[c]	19	0.10 - 6.88	1.21	2.20
TPM[d]	20	0.02 – 3.50	0.37	0.65
CPM[e]	6	0.04 – 0.18	0.063	0.08
PM_{10}[f]	13		71.3%	67.2%
$PM_{2.5}$[f]	10		49.8%	51.0%

[a] measured as C using EPA Method 25 or 25A; [b] number of furnaces tested; [c] same for DCE and NDCE furnaces; [d] total (filterable) particulate matter; [e] CPM (condensable particulate matter); [f] PM_{10} & $PM_{2.5}$ as determined using EPA Draft Method for determining PM_{10} & $PM_{2.5}$ - expressed as % of TPM

Table 4.23 Summary of Non-Metal Air Toxic Emissions from NDCE Kraft Recovery Furnaces (in lb/T BLS)

Compound	No. of Sources Tested*	No. of Sources Included	Detects	Min.	Max.	Median	Mean	Std. Dev.	UPL**
Acetaldehyde[b]	23	22	9	1.0E-03	5.0E-02	3.70E-03	6.10E-03	9.97E-03	3.04E-02
Acetone	15	12	8	2.1E-03	3.0E-02	5.00E-03	8.66E-03	8.26E-03	2.23E-02
Acetophenone	5	5	0	<2.3E-02	<8.7E-02	--	--	--	--
Acrolein	20	20	0	<5.2E-04	<6.8E-02	--	--	--	--
Acrylonitrile	2	2	0	<1.6E-04	<3.3E-04	--	--	--	--
Alpha-Terpineol	1	1	0	--	<3.6E-02	<3.6E-02	<3.6E-02	--	--
Benzaldehyde	2	1	1	--	--	7.00E-03	7.00E-03	--	--
Benzene[b]	26	22	16	<5.2E-05	3.0E-02	7.28E-04[a]	5.02E-03	8.25E-03	2.51E-02
Biphenyl	3	3	0	<1.3E-03	<1.7E-03	--	--	--	--
1,3-butadiene	11	11	1	ND	3.7E-04	1.59E-04	1.59E-04	--	3.7E-04
Bromodichloromethane	1	1	0	--	--	<8.1E-02	<8.1E-02	--	--
Carbon Disulfide	7	4	2	<2.0E-04	1.1E-03	6.60E-04	4.55E-04	6.66E-04	2.23E-03
Carbonyl Sulfide	1	1	0	--	--	<2.40E-03	<2.40E-03	--	--
Carbon Tetrachloride	24	5	3	1.3E-06	1.9E-04	1.21E-05	4.33E-05	7.35E-05	1.65E-04
3-Carene	10	6	2	<1.6E-03	6.0E-03	1.84E-03	5.17E-03	3.73E-04	6.13E-03
Chlorobenzene	24	8	5	8.9E-07	1.4E-04	1.46E-05	3.29E-05	4.44E-05	1.06E-04
Chloroform	27	14	3	7.7E-06	5.3E-04	1.42E-05	4.79E-05	1.34E-04	3.78E-04
Chloromethane[b]	3	2	2	5.2E-05	5.5E-05	5.37E-05	5.37E-05	--	--
m-Cresol	1	1	0	--	--	<2.5E-02	<2.5E-02	--	--
o-Cresol	5	5	0	<2.5E-02	<1.3E-01	--	--	--	--
Cresols (mixed isomers)[1]	--	--	--	<5.0E-02	<1.55E-01	--	--	--	--
Cumene	14	6	1	<1.4E-03	5.6E-03	1.63E-03	1.63E-03	--	5.6E-03
p-Cymene	11	8	4	1.4E-05	7.2E-03	1.22E-03	1.69E-03	2.17E-03	5.27E-03
1,2-Dichloroethane	20	2	1	ND	3.1E-07	1.56E-07	1.56E-07	--	--
1,2-Dichloroethylene	13	2	1	ND	6.4E-06	3.20E-06	3.20E-06	--	--
1,2-dimethoxyethane	4	2	1	<1.9E-04	2.0E-04	1.49E-04	1.49E-04	--	2.00E-04
Ethanol	6	6	0	<1.1E-02	<6.7E-02	--	--	--	--
Ethyl Benzene	18	11	3	3.0E-06	9.0E-04	4.62E-05[a]	8.69E-05	2.57E-04	7.26E-04
Formaldehyde	19	19	13	2.2E-03	8.1E-02	7.79E-03	1.47E-02	1.95E-02	6.23E-02
Hexachlorobenzene	1	1	1	6.10E-12	2.20E-11	1.41E-11	1.41E-11	--	--
Hexachlorocyclopentadien	1	1	0	--	--	<6.3E-02	<6.3E-02	--	--

(Continued on next page. See notes at end of table.)

Table 4.23 Continued

Compound	No. of Sources Tested*	No. of Sources Included	Detects	Min.	Max.	Median	Mean	Std. Dev.	UPL**
Hexachloroethane	1	1	0	--	--	<5.5E-02	<5.5E-02	--	--
n-Hexane	14	14	5	1.2E-05	3.6E-03	1.67E-04[a]	5.44E-04	1.19E-03	3.48E-03
Hydrogen Chloride[b]	26	26	24	7.60E-04	9.00E-01	6.00E-02	2.51E-01	3.14E-01	1.01E+00
Isopropanol	6	6	0	<1.4E-02	<7.2E-02	--	--	--	--
Limonene	10	7	2	ND	6.0E-03	1.99E-03	2.57E-03	1.40E-03	6.13E-03
Methanol	26	26	15	7.1E-04	2.3E-01	1.80E-02	4.13E-02	5.94E-02	1.85E-01
Methyl Ethyl Ketone	22	21	7	<9.8E-04	4.4E-02	3.80E-03	5.94E-03	8.93E-03	2.77E-02
Methyl Isobutyl Ketone	21	6	3	<3.4E-04	5.1E-03	4.70E-04	1.26E-03	1.72E-03	5.68E-03
Methylene Chloride[b]	26	20	8	1.2E-05	6.3E-03	1.79E-04	8.44E-04	1.57E-03	4.67E-03
Naphthalene	11	11	6	4.6E-06	1.3E-03	1.64E-04	2.64E-04	3.71E-04	8.76E-04
Phenol[b]	14	10	2	<5.6E-03	2.8E-02	1.37E-02	1.55E-02	4.27E-03	2.62E-02
alpha-Pinene	13	12	6	ND	3.1E-02	1.50E-03	4.70E-03	8.10E-03	2.48E-02
beta-Pinene	13	6	3	ND	5.1E-03	1.49E-03	2.62E-03	1.59E-03	5.24E-03
Propionaldehyde	9	2	1	<5.6E-03	1.0E-02	6.52E-03	6.52E-03	--	--
Styrene	19	19	6	5.6E-06	1.6E-03	9.07E-05[a]	2.97E-04	6.03E-04	1.29E-03
Sulfuric Acid[b]	6	6	4	<4.7E-03	7.1E-02	7.00E-03	2.93E-02	2.49E-02	7.04E-02
Tetrachloroethylene	19	17	4	ND	3.0E-03	2.24E-05[a]	2.16E-04	6.97E-04	1.92E-03
Toluene[b]	25	19	10	5.6E-05	3.7E-03	2.96E-04[a]	6.44E-04	1.04E-03	3.18E-03
1,2,4-Trichlorobenzene	19	18	3	0.0E+00	8.7E-03	1.50E-04	5.85E-04	2.03E-03	5.55E-03
1,1,1-Trichloroethane	25	3	2	ND	1.1E-05	5.90E-07	3.84E-06	7.31E-06	1.59E-05
1,1,2-Trichloroethane	22	2	1	ND	2.4E-05	1.20E-05	1.20E-05	--	--
Trichloroethylene	24	3	2	ND	3.5E-05	7.90E-07	1.19E-05	2.41E-05	5.16E-05
Vinyl chloride	2	2	2	2.7E-06	3.5E-06	3.07E-06	3.07E-06	--	--
m,p-Xylene	14	9	5	5.5E-06	2.7E-03	4.40E-04	7.06E-04	9.07E-04	2.20E-03
o-Xylene	14	9	5	1.9E-06	1.9E-03	5.00E-04	7.08E-04	5.93E-04	1.69E-03
Xylenes (mixed isomers)[b]	23	18	9	7.4E-06	4.6E-03	5.00E-04	7.06E-04	1.25E-03	2.77E-03
Terpenes	8	6	4	4.5E-03	9.2E-02	1.80E-02	3.02E-02	2.94E-02	7.87E-02
VOCs as C	19	19	17	ND	4.3E-01	9.30E-02	1.53E-01	1.56E-01	4.74E-01

(Continued on next page. See notes at end of table.)

Table 4.23 Continued

Compound	No. of Sources Tested*	No. of Sources Included	Detects	Min.	Max.	Median	Mean	Std. Dev.	UPL**
TRS & Speciated Reduced Sulfur Compounds									
Hydrogen Sulfide	5	5	4	8.1E-04	1.3E-01	1.68E-02[a]	3.45E-02	4.98E-02	1.17E-01
Methyl Mercaptan	13	13	3	<3.6E-03	5.4E-02	5.34E-03	1.36E-02	1.45E-02	3.75E-02
Dimethyl Sulfide	13	13	2	<5.2E-03	3.3E-02	5.23E-03	7.91E-03	7.93E-03	2.75E-02
Dimethyl Disulfide	13	3	1	<2.1E-03	4.8E-03	2.06E-03	2.06E-03	--	4.80E-03
TRS as S	6	6	4	4.0E-03	1.7E-01	2.59E-02[a]	3.96E-02[2]	6.03E-02	1.46E-01

*No. of sources tested represents the total number of sources that were tested. No. of sources included represents the sources for which data were included in the analysis for estimating averages. The difference represents sources whose data were rejected mainly because they yielded non-detects with detection limits exceeding the highest detected observation. Occasionally, an observation confirmed to be a statistical outlier was also rejected.

**UPL=upper prediction limit. Estimated using mean + 1.65 x std. dev. for normally distributed data and the Chebyshev Inequality with 85% confidence coefficient for non-normally distributed data.

NOTES: Averages (median and mean) are not estimated when data set has all non-detects; in such cases, only min and max DLs of NDs are provided.

BLS=black liquor solids

[1]Best estimate for cresols (mixed isomers) obtained by adding estimates for o- and m-cresols. [2]This is the mean TRS for the six units at which either each of the four reduced sulfur compounds (RSCs) or the total TRS was measured. TRS as the sum of the four RSC means (S basis) would be 0.0467 lb S/ton BLS.

[a] Modified Kaplan-Meier median - 50 percentile value obtained from best curve fit of the quantiles generated by the K-M subroutine. [b]See discussion in Section 4.3.2.4.

Table 4.24 Summary of Trace Metal Emissions from NDCE Kraft Recovery Furnaces (lb/ton BLS)

Trace Metal	No. of Sources Tested*	No. of Sources Included*	Detects	Min	Max	Median	Mean	Std. Dev.	UPL**
Antimony (Sb)	14	13	6	1.7E-07	4.5E-06	3.20E-07	1.00E-06	1.38E-06	3.27E-06
Arsenic (As)	14	10	4	5.6E-08	4.4E-06	3.20E-07	1.47E-06	1.63E-06	4.16E-06
Beryllium (Be)	14	14	6	5.80E-08	6.80E-06	4.06E-07	9.68E-07	1.67E-06	5.09E-06
Cadmium (Cd)	14	14	12	7.20E-07	4.80E-05	6.37E-06	1.16E-05	1.35E-05	3.45E-05
Chromium (Cr)	14	14	14	2.68E-06	3.50E-04	1.64E-05	4.49E-05	9.11E-05	2.69E-04
Hexavalent Cr[1]	5	5	4	5.80E-07	3.30E-05	8.30E-06	1.47E-05	1.30E-05	3.61E-05
Cobalt (Co)	14	13	9	3.80E-07	7.70E-06	1.61E-06	2.30E-06	2.07E-06	5.71E-06
Lead (Pb)	14	14	12	1.10E-06	7.00E-05	9.81E-06	2.10E-05	2.27E-05	7.70E-05
Manganese (Mn)	14	13	13	5.42E-06	4.40E-04	6.13E-05	9.98E-05	1.15E-04	3.84E-04
Mercury Hg)	14	13	8	<2.0E-07	2.40E-05	3.38E-06	5.46E-06	6.82E-06	1.67E-05
Nickel (Ni)	14	14	13	4.20E-06	6.66E-04	3.18E-05	7.92E-05	1.69E-04	4.95E-04
Selenium (Se)	14	11	7	2.00E-06	1.50E-05	2.50E-06	5.35E-06	4.97E-06	1.77E-05
Phosphorus (P)[2]	10	13	10	6.40E-05	2.60E-03	1.96E-04	3.89E-04	6.51E-04	2.00E-03
Copper (Cu)	8	8	8	1.04E-05	4.80E-05	2.03E-05	2.61E-05	1.43E-05	4.97E-05
Silver (Ag)	7	6	5	6.20E-08	4.70E-06	4.00E-07	1.58E-06	2.00E-06	6.73E-06
Barium (Ba)	9	7	7	5.60E-06	5.60E-05	1.94E-05	2.36E-05	1.78E-05	5.29E-05
Thallium (Tl)	5	3	3	9.40E-10	4.00E-08	3.20E-09	1.47E-08	2.19E-08	5.09E-08
Zinc (Zn)	8	8	8	6.62E-06	8.04E-04	5.80E-05	2.32E-04	2.97E-04	9.81E-04

Other Trace Metals and Non-Metals (in lb/ton BLS)

	Sources	Detects	Mean	Median		Sources	Detects	Mean	Median
Aluminum (Al)	3	3	1.2E-04	1.2E-04	Molybdenum (Mo)	3	3	2.5E-06	2.3E-06
Boron (B)	3	3	3.1E-03	3.9E-03	Sodium (Na)	3	3	2.8E-02	3.6E-02
Bismuth (Bi)	3	3	1.4E-07	2.3E-07	Sulfur (S)[3]	3	3	1.8E-01	1.5E+00
Calcium (Ca)	3	3	9.1E-04	1.3E-03	Silicon (Si)	3	3	2.5E-03	2.5E-03
Chlorine (Cl)	3	3	3.4E-03	2.6E-01	Tin (Sn)	3	3	1.7E-06	3.6E-06
Iron (Fe)	3	3	2.3E-04	2.3E-04	Strontium (Sr)	3	3	5.6E-06	5.6E-06
Potassium (K)	3	3	4.1E-03	5.4E-03	Thorium (Th)	3	3	8.4E-08	7.1E-08
Lithium (Li)	3	3	1.6E-07	2.4E-07	Titanium (Ti)	3	3	6.8E-06	1.0E-05
Magnesium (Mg)	3	3	8.4E-05	3.4E-04	Uranium (U)	3	3	4.3E-09	6.4E-09
					Vanadium (V)	3	3	4.2E-07	3.8E-07

*No. of sources tested represents the total number of sources that were tested. No. of sources included represents the sources for which data were included in the analysis for estimating averages. The difference represents sources whose data were rejected mainly because they yielded non-detects with detection limits exceeding the highest detected observation. Occasionally, an observation confirmed to be a statistical outlier was also rejected.

**UPL=upper prediction limit. Estimated using mean + 1.65 x std. dev. for normally distributed data and the Chebyshev Inequality with 85% confidence coefficient for non-normally distributed data.

NOTE: Averages (median and mean) are not estimated when data set has all non-detects; in such cases, only min and max DLs of NDs are provided.

[1]Total Cr emissions for 3 of the 5 units were also available yielding an average ratio of Cr^{+6}/tot Cr of 22.9% (range 1.5 to 50.0%). [2]Phosphorus is a non-metal. [3]Most likely in the form of chlorides or sulfates.

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Subpart AA—Pulp and Paper Manufacturing

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Table AA–1 to Subpart AA of Part 98—Kraft Pulping Liquor Emissions Factors for Biomass-Based CO_2, CH_4, and N_2O

Wood furnish	Biomass-based emissions factors (kg/mmBtu HHV)		
	CO_2[a]	CH_4	N_2O
North American Softwood	94.4	0.030	0.005
North American Hardwood	93.7		
Bagasse	95.5		
Bamboo	93.7		
Straw	95.1		

[a]Includes emissions from both the recovery furnace and pulp mill lime kiln.

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PART 98—MANDATORY GREENHOUSE GAS REPORTING
Subpart C—General Stationary Fuel Combustion Sources

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Table C–1 to Subpart C—Default CO&ihel2; Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/mmBtu
Anthracite	25.09	103.54
Bituminous	24.93	93.40
Subbituminous	17.25	97.02
Lignite	14.21	96.36
Coke	24.80	102.04
Mixed (Commercial sector)	21.39	95.26
Mixed (Industrial coking)	26.28	93.65
Mixed (Industrial sector)	22.35	93.91
Mixed (Electric Power sector)	19.73	94.38
Natural gas	mmBtu/scf	kg CO_2/mmBtu
(Weighted U.S. Average)	1.028×10^{-3}	53.02
Petroleum products	mmBtu/gallon	kg CO_2/mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.135	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG)	0.092	62.98
Propane	0.091	61.46

Propylene	0.091	65.95
Ethane	0.069	62.64
Ethanol	0.084	68.44
Ethylene	0.100	67.43
Isobutane	0.097	64.91
Isobutylene	0.103	67.74
Butane	0.101	65.15
Butylene	0.103	67.73
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.83
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.129	70.97
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.49
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.49
Other fuels-solid	mmBtu/short ton	kg CO_2/mmBtu
Municipal Solid Waste	9.95[1]	90.7
Tires	26.87	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas[2]	1.388×10^{-3}	59.00
Biomass fuels—solid	mmBtu/short ton	kg CO_2/mmBtu
Wood and Wood Residuals	15.38	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	25.83	105.51
Biomass fuels—gaseous	mmBtu/scf	kg CO_2/mmBtu

Biogas (Captured methane)	0.841×10^{-3}	52.07
Biomass Fuels—Liquid	mmBtu/gallon	kg CO_2/mmBtu
Ethanol	0.084	68.44
Biodiesel	0.128	73.84
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

[1]Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

[2]Reporters subject to subpart X of this part that are complying with §98.243(d) or subpart Y of this part may only use the default HHV and the default CO2 emission factor for fuel gas combustion under the conditions prescribed in §98.243(d)(2)(i) and (d)(2)(ii) and §98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C–5) or Tier 4.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 79153, Dec. 17, 2010]

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PART 98—MANDATORY GREENHOUSE GAS REPORTING
Subpart C—General Stationary Fuel Combustion Sources

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Table C–2 to Subpart C—Default CH&ihel4; and N&ihel2;O Emission Factors for Various Types of Fuel

Fuel type	Default CH&ihel4; emission factor (kg CH&ihel4;/mmBtu)	Default N&ihel2;O emission factor (kg N&ihel2;O/mmBtu)
Coal and Coke (All fuel types in Table C–1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C–1)	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C–1)	3.2×10^{-02}	4.2×10^{-03}
Biogas	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C–1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH&ihel4;/mmBtu.

[75 FR 79154, Dec. 17, 2010]

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Table 1.3-2. CONDENSABLE PARTICULATE MATTER EMISSION FACTORS FOR OIL COMBUSTION[a]

Firing Configuration[b] (SCC)	Controls	CPM - TOT[c, d]		CPM - IOR[c, d]		CPM - ORG[c, d]	
		Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING	Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING	Emission Factor ($lb/10^3$ gal)	EMISSION FACTOR RATING
No. 2 oil fired (1-01-005-01, 1-02-005-01, 1-03-005-01)	All controls, or uncontrolled	1.3[d, e]	D	65% of CPM-TOT emission factor[c]	D	35% of CPM-TOT emission factor[c]	D
No. 6 oil fired (1-01-004-01/04, 1-02-004-01, 1-03-004-01)	All controls, or uncontrolled	1.5[f]	D	85% of CPM-TOT emission factor[d]	E	15% of CPM-TOT emission factor[d]	E

a All condensable PM is assumed to be less than 1.0 micron in diameter.
b No data are available for numbers 3, 4, and 5 oil. For number 3 oil, use the factors provided for number 2 oil. For numbers 4 and 5 oil, use the factors provided for number 6 oil.
c CPM-TOT = total condensable particulate matter.
CPM-IOR = inorganic condensable particulate matter.
CPM-ORG = organic condensable particulate matter.
d To convert to lb/MMBtu of No. 2 oil, divide by 140 MMBtu/10^3 gal. To convert to lb/MMBtu of No. 6 oil, divide by 150 MMBtu/10^3 gal.
e References: 76-78.
f References: 79-82.

Table 1.3-3. EMISSION FACTORS FOR TOTAL ORGANIC COMPOUNDS (TOC), METHANE, AND NONMETHANE TOC (NMTOC) FROM UNCONTROLLED FUEL OIL COMBUSTION[a]

EMISSION FACTOR RATING: A

Firing Configuration (SCC)	TOC[b] Emission Factor (lb/10^3 gal)	Methane[b] Emission Factor (lb/10^3 gal)	NMTOC[b] Emission Factor (lb/10^3 gal)
Utility boilers			
No. 6 oil fired, normal firing (1-01-004-01)	1.04	0.28	0.76
No. 6 oil fired, tangential firing (1-01-004-04)	1.04	0.28	0.76
No. 5 oil fired, normal firing (1-01-004-05)	1.04	0.28	0.76
No. 5 oil fired, tangential firing (1-01-004-06)	1.04	0.28	0.76
No. 4 oil fired, normal firing (1-01-005-04)	1.04	0.28	0.76
No. 4 oil fired, tangential firing (1-01-005-05)	1.04	0.28	0.76
Industrial boilers			
No. 6 oil fired (1-02-004-01/02/03)	1.28	1.00	0.28
No. 5 oil fired (1-02-004-04)	1.28	1.00	0.28
Distillate oil fired (1-02-005-01/02/03)	0.252	0.052	0.2
No. 4 oil fired (1-02-005-04)	0.252	0.052	0.2
Commercial/institutional/residential combustors			
No. 6 oil fired (1-03-004-01/02/03)	1.605	0.475	1.13
No. 5 oil fired (1-03-004-04)	1.605	0.475	1.13
Distillate oil fired (1-03-005-01/02/03)	0.556	0.216	0.34
No. 4 oil fired (1-03-005-04)	0.556	0.216	0.34
Residential furnace (A2104004/A2104011)	2.493	1.78	0.713

a To convert from lb/103 gal to kg/103 L, multiply by 0.12. SCC = Source Classification Code.
b References 29-32. Volatile organic compound emissions can increase by several orders of magnitude if the boiler is improperly operated or is not well maintained.

Table 1.3-4. CUMULATIVE PARTICLE SIZE DISTRIBUTION AND SIZE-SPECIFIC EMISSION FACTORS FOR UTILITY BOILERS FIRING RESIDUAL OILa

Particle Size[b] (μm)	Cumulative Mass % Stated Size			Cumulative Emission Factor lb/10^3 gal)					
		Controlled		Uncontrolled[c]		ESP Controlled[d]		Scrubber Controlled[e]	
	Uncon-trolled	ESP	Scrubber	Emission Factor	EMISSION FACTOR RATING	Emission Factor	EMISSION FACTOR RATING	Emission Factor	EMISSION FACTOR RATING
15	80	75	100	6.7A	C	0.05A	E	0.50A	D
10	71	63	100	5.9A	C	0.042A	E	0.50A	D
6	58	52	100	4.8A	C	0.035A	E	0.50A	D
2.5	52	41	97	4.3A	C	0.028A	E	0.48A	D
1.25	43	31	91	3.6A	C	0.021A	E	0.46A	D
1.00	39	28	84	3.3A	C	0.018A	E	0.42A	D
0.625	20	20	64	1.7A	C	0.007A	E	0.32A	D
TOTAL	100	100	100	8.3A	C	0.067A	E	0.50A	D

a Reference 26. Source Classification Codes 1-01-004-01/04/05/06 and 1-01-005-04/05. To convert from lb/103 gal to kg/m3, multiply by 0.120. ESP = electrostatic precipitator.

b Expressed as aerodynamic equivalent diameter.

c Particulate emission factors for residual oil combustion without emission controls are, on average, a function of fuel oil grade and sulfur content where S is the weight % of sulfur in the oil. For example, if the fuel is 1.00% sulfur, then S = 1.
No. 6 oil: A = 1.12(S) + 0.37
No. 5 oil: A = 1.2
No. 4 oil: A = 0.84

d Estimated control efficiency for ESP is 99.2%.

e Estimated control efficiency for scrubber is 94%

Table 1.3-11. EMISSION FACTORS FOR METALS FROM UNCONTROLLED NO. 6 FUEL OIL COMBUSTION[a]

Metal	Average Emission Factor[b, d] (lb/10^3 Gal)	EMISSION FACTOR RATING
Antimony	5.25E-03[c]	E
Arsenic	1.32E-03	C
Barium	2.57E-03	D
Beryllium	2.78E-05	C
Cadmium	3.98E-04	C
Chloride	3.47E-01	D
Chromium	8.45E-04	C
Chromium VI	2.48E-04	C
Cobalt	6.02E-03	D
Copper	1.76E-03	C
Fluoride	3.73E-02	D
Lead	1.51E-03	C
Manganese	3.00E-03	C
Mercury	1.13E-04	C
Molybdenum	7.87E-04	D
Nickel	8.45E-02	C
Phosphorous	9.46E-03	D
Selenium	6.83E-04	C
Vanadium	3.18E-02	D
Zinc	2.91E-02	D

[a] Data are for residual oil fired boilers, Source Classification Codes (SCCs) 1-01-004-01/04.

[b] References 64-72. 18 of 19 sources were uncontrolled and 1 source was controlled with low efficiency ESP. To convert from lb/10^3 gal to kg/10^3 L, multiply by 0.12.

[c] References 29-32,40-44.

[d] For oil/water mixture, reduce factors in proportion to water content of the fuel (due to dilution). To adjust the listed values for water content, multiply the listed value by 1-decimal fraction of water (ex: For fuel with 9 percent water by volume, multiply by 1-0.9=.91).

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to 1b/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 \text{ scf}] = (3.67)$ (CON)(C)(D), where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, $4.2x10^4$ $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2.
Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

TABLE 1.4-4. EMISSION FACTORS FOR METALS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
7440-38-2	Arsenic[b]	2.0E-04	E
7440-39-3	Barium	4.4E-03	D
7440-41-7	Beryllium[b]	<1.2E-05	E
7440-43-9	Cadmium[b]	1.1E-03	D
7440-47-3	Chromium[b]	1.4E-03	D
7440-48-4	Cobalt[b]	8.4E-05	D
7440-50-8	Copper	8.5E-04	C
7439-96-5	Manganese[b]	3.8E-04	D
7439-97-6	Mercury[b]	2.6E-04	D
7439-98-7	Molybdenum	1.1E-03	D
7440-02-0	Nickel[b]	2.1E-03	C
7782-49-2	Selenium[b]	<2.4E-05	E
7440-62-2	Vanadium	2.3E-03	D
7440-66-6	Zinc	2.9E-02	E

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. Emission factors preceeded by a less-than symbol are based on method detection limits. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020.

[b] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

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