APPLICATION

AIR CONSTRUCTION PERMIT APPLICATION

For Wiregrass Biomass-Fired Power Plant

Submitted To: Georgia Department of Natural Resources
Environmental Protection Division
4244 International Parkway, Suite 120
Atlanta, GA 30354

Submitted For: Wiregrass Power, LLC
3500 Parkway Lane
Suite 500
Norcross, GA 30092

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

Distribution: 4 Copies – Georgia Department of Natural Resources
2 Copies – Wiregrass Power, LLC
3 Copies – Golder Associates Inc.

December 2009 **093-90124**

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

Stationary Source Permitting Program
4244 International Parkway, Suite 120
Atlanta, Georgia 30354
404/363-7000
Fax: 404/363-7100

SIP AIR PERMIT APPLICATION

EPD Use Only
Date Received: ____ Application No. ____

FORM 1.00: GENERAL INFORMATION

1. Facility Information

Facility Name: Wiregrass Plant
AIRS No. (if known): 04-13- - To be determined
Facility Location: Street: Inner Perimeter Road
City: Valdosta Georgia Zip: 31603 County: Lowndes

2. Facility Coordinates

Latitude: 30° 48' 27" **NORTH** Longitude: 83° 13' 55" **WEST**
UTM Coordinates: 286,500 **EAST** 3,410,400 **NORTH** **ZONE** 17

3. Facility Owner

Name of Owner: Wiregrass Power, LLC
Owner Address Street: 3500 Parkway Lane, Suite 500
City: Norcross State: GA Zip: 30092

4. Permitting Contact and Mailing Address

Contact Person: Robert Turner Title: Director, Project Development
Telephone No.: 678-534-5834 Ext. ____ Fax No.: ____
Email Address: rturner@SterlingPlanet.com
Mailing Address: Same as: Facility Location: ☐ Owner Address: ☒ Other: ☐
If Other: Street Address: 3500 Parkway Lane, Suite 500
City: Norcross State: GA Zip: 30092

5. Authorized Official

Name: Robert Turner Title: Director, Project Development
Address of Official Street: 3500 Parkway Lane, Suite 500
City: Norcross State: GA Zip: 30092

This application is submitted in accordance with the provisions of the Georgia Rules for Air Quality Control and, to the best of my knowledge, is complete and correct.

Signature: Robert Turner Date: 12/16/09

6. Reason for Application: (Check all that apply)

☒ New Facility (to be constructed)

☐ Existing Facility (initial or modification application)

☒ Permit to Construct

☐ Permit to Operate

☐ Change of Location

☐ Permit to Modify Existing Equipment: Affected Permit No.: ____________

☐ Revision of Data Submitted in an Earlier Application

Application No.: ____________

Date of Original Submittal: ____________

7. Permitting Exemption Activities (for permitted facilities only):

Have any exempt modifications based on emission level per Georgia Rule 391-3-1-.03(6)(i)(3) been performed at the facility that have not been previously incorporated in a permit?

☐ **No** ☐ **Yes, please fill out the SIP Exemption Attachment** (See Instructions for the attachment download)

8. Has assistance been provided to you for any part of this application?

☐ **No** ☐ **Yes, SBAP** ☒ **Yes, a consultant has been employed or will be employed.**

If yes, please provide the following information:

Name of Consulting Company: Golder Associates Inc.

Name of Contact: Steve Moeller, PE / Robert C. McCann, Jr.

Telephone No.: (770) 496-1893 / (352) 336-5600 Fax No.: (770) 934-9476 / (352) 336-6603

Email Address: Steve_Moeller@golder.com / bmccann@golder.com

Mailing Address: Street: 3730 Chamblee Tucker Road

City: Atlanta State: GA Zip: 30341

Describe the Consultant's Involvement:

Prepare air construction permit application for the proposed 45-MW (gross) wood-fired power plant in Valdosta, GA

9. Submitted Application Forms: Select only the necessary forms for the facility application that will be submitted.

No. of Forms	Form
1	2.00 Emission Unit List
1	2.01 Boilers and Fuel Burning Equipment
	2.02 Storage Tank Physical Data
	2.03 Printing Operations
	2.04 Surface Coating Operations
	2.05 Waste Incinerators (solid/liquid waste destruction)
	2.06 Manufacturing and Operational Data
1	3.00 Air Pollution Control Devices (APCD)
	3.01 Scrubbers
1	3.02 Baghouses & Other Filter Collectors
	3.03 Electrostatic Precipitators
1	4.00 Emissions Data
1	5.00 Monitoring Information
1	6.00 Fugitive Emission Sources
	7.00 Air Modeling Information

10. Construction or Modification Date

Estimated Start Date: December, 2010

11. **If confidential information is being submitted in this application, were the guidelines followed in the "Procedures for Requesting that Submitted Information be treated as Confidential"? Not Appliciable**

☐ No ☐ Yes

12. New Facility Emissions Summary

Criteria Pollutant	New Facility	
	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)	246.8	246.8
Nitrogen oxides (NOx)	246.8	246.8
Particulate Matter (PM)	135.0	135.0
PM <10 microns (PM10)	112.7	112.7
PM <2.5 microns (PM2.5)	86.3	86.3
Sulfur dioxide (SO2)	246.8	246.8
Volatile Organic Compounds (VOC)	60.3	60.3
Total Hazardous Air Pollutants (HAPs)	13.9	13.9
Individual HAPs Listed Below:		
See Table 2-3 of Attachment A		

13. Existing Facility Emissions Summary

Criteria Pollutant	Current Facility		After Modification	
	Potential (tpy)	Actual (tpy)	Potential (tpy)	Actual (tpy)
Carbon monoxide (CO)				
Nitrogen oxides (NOx)				
Particulate Matter (PM)				
PM <10 microns (PM10)				
PM <2.5 microns (PM2.5)				
Sulfur dioxide (SO2)				
Volatile Organic Compounds (VOC)				
Total Hazardous Air Pollutants (HAPs)				
Individual HAPs Listed Below:				

14. 4-Digit Facility Identification Code:

SIC Code: 4911 SIC Description: Electric Services

NAICS Code: 221119 NAICS Description: Other Electric Power Generation

15. Description of general production process and operation for which a permit is being requested. If necessary, attach additional sheets to give an adequate description. Include layout drawings, as necessary, to describe each process. References should be made to source codes used in the application.

Application is for the construction of a nominal 45-MW (gross) biomass-fired power generation facility consisting of one 626-MMBtu/hr heat input capacity bubbling fluidized bed boiler, ash and biomass material handling operations, one mechanical draft cooling tower, and one 150-hp diesel fire pump engine.

See application report in Attachment A for additional information.

16. Additional information provided in attachments as listed below:

Attachment A - Application Report

Attachment B - Acid Rain Forms

Attachment C -

Attachment D -

Attachment E -

Attachment F -

17. Additional Information: Unless previously submitted, include the following two items:

☒ Plot plan/map of facility location or date of previous submittal: see Application Report

☒ Flow Diagram or date of previous submittal: see Application Report

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 2.00 – EMISSION UNIT LIST

Emission Unit ID	Name	Manufacturer and Model Number	Description
B1	Boiler Unit 1	to be determined	Biomass-fired bubbling fluidized bed boiler
COOL	Cooling Tower	to be determined	3-cell mechanical draft cooling tower
ASILO	Ash Silo	to be determined	Ash storage silo
HOGT	Hog Tower	to be determined	Hog tower
FPUMP	Fire Pump	to be determined	150-hp Diesel fire pump engine

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 2.01 – BOILERS AND FUEL BURNING EQUIPMENT

Emission Unit ID	Type of Burner	Type of Draft[1]	Design Capacity of Unit (MMBtu/hr Input)	Percent Excess Air	Dates		Date & Description of Last Modification
					Construction	Installation	
B1	Bubbling Fluidized Bed	Induced	626 (HHV)	25	June 2010	September 2012	Not Applicable
FPUMP	Internal Combustion Engine	Not Applicable			June 2010	September 2012	Not Applicable

[1] This column does not have to be completed for natural gas only fired equipment.

(a)
Facility Name: Wiregrass Plant **Date of Application:** December 2009

FUEL DATA

Emission Unit ID	Fuel Type	Potential Annual Consumption				Hourly Consumption		Heat Content		Percent Sulfur		Percent Ash in Solid Fuel	
		Total Quantity		Percent Use by Season									
		Amount	Units	Ozone Season May 1 - Sept 30	Non-ozone Season Oct 1 - Apr 30	Max.	Avg.	Min.	Avg.	Max.	Avg.	Max.	Avg.
B1	Wood Chip*	637,650	tons	41.9	58.1	72.8 tons	NA	4,300 Btu/lb	NA	0.05	NA	1.0	**NA**
B1	Natural Gas	60	MMft3	NA	NA	0.12 MMft3	NA	1,000 Btu/ft3 (HHV)	NA	1.0 gr/100 scf	NA	NA	**NA**

Fuel Supplier Information

Fuel Type	Name of Supplier	Phone Number	Supplier Location			
			Address	City	State	Zip
Wood Chip	Various					
NG	Georgia Natural Gas					

*Includes 0.5% sludge
NA – Not Available

Facility Name: Wiregrass Plant **Date of Application:** December 2009

Form 3.00 – AIR POLLUTION CONTROL DEVICES - PART A: GENERAL EQUIPMENT INFORMATION

APCD Unit ID	Emission Unit ID	APCD Type (Baghouse, ESP, Scrubber etc)	Date Installed	Make & Model Number (Attach Mfg. Specifications & Literature)	Unit Modified from Mfg Specifications?	Gas Temp. °F		Inlet Gas Flow Rate (acfm)
						Inlet	Outlet	
SCR	B1	Selective Catalytic Reduction	To be determined	To be determined	No	NA	NA	240,282
SORB	B1	Sorbent Injection	To be determined	To be determined	No	NA	NA	240,282
BAG1	B1	Baghouse	To be determined	To be determined	No	NA	NA	240,282
COCAT	B1	CO Oxidation Catalyst	To be determined	To be determined	No	NA	NA	240,282
BAG2	ASILO	Baghouse	To be determined	To be determined	No	NA	Ambient	2
CYC	HOGT	Cyclone	To be determined	To be determined	No	NA	Ambient	10,000
DRIFT	COOL	Drift Eliminator	To be determined	To be determined	No	NA	110	1,121,000

NA – Not Available

Facility Name: Wiregrass Plant **Date of Application:** December 2009

Form 3.00 – AIR POLLUTION CONTROL DEVICES – PART B: EMISSION INFORMATION

APCD Unit ID	Pollutants Controlled	Percent Control Efficiency		Inlet Stream To APCD		Exit Stream From APCD		Pressure Drop Across Unit (Inches of water)
		Design	Actual	lb/hr	Method of Determination	lb/hr	Method of Determination	
SCR	NOx	57.1	NA	131.5	Mass Balance	56.3	Manufacturer Specs	NA
SORB	SO2	61.3	NA	145.6	Mass Balance	56.3	Manufacturer Specs	NA
SORB	HCl	87.5	NA	15.0	Mass Balance	1.9	Manufacturer Specs	NA
BAG1	PM	99.05	NA	1,652.6	Mass Balance	15.7	Manufacturer Specs	NA
BAG1	PM10	99.05	NA	1,652.6	Mass Balance	15.7	Manufacturer Specs	NA
BAG1	PM2.5	99.05	NA	1,074.2	Mass Balance	10.2	Manufacturer Specs	NA
COCAT	CO	55	NA	125.2	Mass Balance	56.3	Manufacturer Specs	NA
COCAT	VOC	55	NA	13.8	Mass Balance	6.2	Manufacturer Specs	NA
BAG2	PM/PM10/PM2.5	NA	NA	NA	NA	0.00034	Manufacturer Specs	NA
CYC	PM/PM10/PM2.5	NA	NA	NA	NA	8.6	Manufacturer Specs	NA
DRIFT	PM/PM10/PM2.5	NA	NA	NA	NA	0.001% drift	Manufacturer Specs	NA

NA – Not Available

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 3.02 – BAGHOUSES & OTHER FILTER COLLECTORS

APCD ID	Filter Surface Area (ft^2)	No. of Bags	Inlet Gas Dew Point Temp. (°F)	Inlet Gas Temp. (°F)	Bag or Filter Material	Pressure Drop (inches of water)	Cleaning Method	Gas Cooling Method	Leak Detection System Type
BAG1	NA	NA	NA	NA	NA	NA	NA	NA	NA
BAG2	NA	NA	NA	NA	NA	NA	NA	NA	NA

Attach a physical description, dimensions and drawings for each baghouse and any additional information available such as particle size, maintenance schedules, monitoring procedures and breakdown/by-pass procedures. Explain how collected material is disposed of or utilized. Include the attachment in the list on Form 1.00 *General Information*, Item 16

NA – Not Available

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination
B1	SCR	S001	NOx	56.3	56.3	246.8	246.8	See Attachment A , Application Report
B1	COCAT	S001	CO	56.3	56.3	246.8	246.8	See Attachment A , Application Report
B1	COCAT	S001	VOC	6.2	6.2	27.1	27.1	See Attachment A , Application Report
B1	BAG1	S001	PM/PM10	15.7	15.7	68.5	68.5	See Attachment A , Application Report
B1	BAG1	S001	PM2.5	10.2	10.2	44.6	44.6	See Attachment A , Application Report
B1	SORB	S001	SO2	56.3	56.3	246.8	246.8	See Attachment A , Application Report
B1	NA	S001	SAM	3.5	3.5	15.1	15.1	See Attachment A , Application Report
B1	BAG1	S001	Lead	0.2	0.2	1.03	1.03	See Attachment A , Application Report
COOL	DRIFT	COOL1-COOL3	PM	0.008	0.008	0.036	0.036	See Attachment A , Application Report
COOL	DRIFT	COOL1-COOL3	PM10/PM2.5	0.004	0.004	0.018	0.018	See Attachment A , Application Report
ASILO	BAG2	S002	PM/PM10/PM2.5	0.0003	0.0003	0.0015	0.0015	See Attachment A , Application Report
HOGT	CYC	S003	PM/PM10/PM2.5	8.6	8.6	37.5	37.5	See Attachment A , Application Report

Facility Name: ________________________ **Date of Application:** ______________

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination

Facility Name: ______________________________ **Date of Application:** ______________

FORM 4.00 – EMISSION INFORMATION

Emission Unit ID	Air Pollution Control Device ID	Stack ID	Pollutant Emitted	Emission Rates				
				Hourly Actual Emissions (lb/hr)	Hourly Potential Emissions (lb/hr)	Actual Annual Emission (tpy)	Potential Annual Emission (tpy)	Method of Determination

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 5.00 MONITORING INFORMATION

Emission Unit ID/ APCD ID	Emission Unit/APCD Name	Monitored Parameter		Monitoring Frequency
		Parameter	Units	
B1	BFB Boiler	NOx	ppm	Continuous
B1	BFB Boiler	CO	ppm	Continuous
B1	BFB Boiler	SO_2	lb/hr	Continuous

Comments:

Facility Name: Wiregrass Plant **Date of Application:** December 2009

FORM 6.00 – FUGITIVE EMISSION SOURCES

Fugitive Emission Source ID	Description of Source	Emission Reduction Precautions	Pot. Fugitive Emissions	
			Amount (tpy)	Pollutant **
MH1	Truck Dumps	None	0.019	PM
MH2	Conveyors #1-To-Conveyor #2	Enclosure	0.001	PM
MH3	Conveyors #2-To-Screen	Enclosure	0.001	PM
MH4	Screen	None	7.971	PM
MH5	Screen-To-Hogger	Enclosure	0.001	PM
MH6	Hogger	Enclosed	0.09	PM
MH7	Hogger-To-Storage Conveyor (Conveyor #3)	Enclosure	0.0005	PM
MH8	Screen-To-Storage Conveyor (Conveyor #3)	Enclosure	0.0005	PM
MH9	Storage Conveyor (Conveyor #3)-To-Stacker/Reclaimer	Enclosure	0.001	PM
MH10	Stacker/Reclaimer-To-Wood Chip Storage Pile	Watering	0.005	PM
MH11	Underpile Reclaimers	Enclosed	0.0009	PM
MH12	Reclaimers-To-Conveyor #4	Enclosure	0.001	PM
MH13	Conveyor #4-To-Conveyor #5	Enclosure	0.001	PM
MH14	Conveyor #5-To-Drag Chain Conveyor	Enclosure	0.001	PM
MH15	Drag Chain Conveyor-To-Boiler Metering Bins	Enclosure	0.001	PM
MH16	Drag Chain Conv. Overflow-To-Return Conveyor #6	Enclosure	0.0001	PM
MH17	Return Conveyor #6-To-Storage Conveyor (Conveyor #3)	Enclosure	0.0001	PM
MH18	Wood Chip Storage Pile	Watering	0.05	PM
MH19	Bulldozer for Wood Chip Storage Pile Maintenance	None	5.29	PM
MH20	Bulldozer at Truck Dumps	None	5.29	PM
MH21	Wood Truck Traffic On Paved Roads	None	10.10	PM
MH22	Bulldozer for Wood Chip Storage Pile Maintenance	Watering	32.42	PM
MH23	Bulldozer at Truck Dumps	Watering	32.42	PM

** See Table 2-6 for PM10 and PM2.5 emissions rates.

ATTACHMENT A

APPLICATION REPORT

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1.0 INTRODUCTION

Wiregrass Power, LLC is proposing to construct a 45-megawatt (MW) biomass-fired power plant (Wiregrass Plant) in Valdosta, Lowndes County, Georgia. The proposed facility will consist of one bubbling fluidized bed (BFB) boiler, which will burn approximately 99.5-percent wood waste and 0.5-percent sludge obtained from Valdosta's Mud Creek Wastewater Treatment Plant. The woody biomass will be delivered to the facility by trucks. The proposed facility will be a minor source of regulated air pollutants generated by the following main process areas:

- Main biomass boiler
- Material handling including wood chip handling, storage, ash handling, and shipping
- Ancillary equipment – cooling tower, ash silo and hog tower dust collectors, and diesel fire pump engine

The regulated air pollutants are the following:

- Particulate matter (PM), PM with aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and PM with aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$)
- Sulfur dioxide (SO_2)
- Nitrogen oxides (NO_x)
- Carbon monoxide (CO)
- Volatile organic compounds (VOCs)
- Lead (Pb)
- Sulfuric acid mist (SAM)

The facility will also be a minor source of hazardous air pollutants (HAPs). The biomass-fired BFB boiler will have a maximum design heat input rate of 626 million British thermal units per hour (MMBtu/hr). The corresponding steam production rate is 402,600 pounds per hour (lb/hr) and the boiler efficiency is rated at 70 percent. The boiler will be permitted for 8,760 hours per year (hr/yr) operation.

The BFB boiler will use a selective catalytic reduction (SCR) system and a modern overfire air system for minimizing NO_x emissions. Fabric filters (baghouses) will be used for control of PM and trace element emissions, which are emitted as solid particles. A dry in-duct sorbent injection system will be used to control SO_2 and hydrogen chloride (HCl) emissions. An oxidation catalyst system will be used to control CO and VOC emissions. The low Pb content of the biomass fuel will result in extremely low mercury (Hg) and Pb emissions.

Lowndes County is classified as attainment for all regulated air pollutants. The construction of the Wiregrass Plant will require a minor source air construction permit under the state and federal New Source Review (NSR) program.

This permit application document presents the State of Georgia Department of Natural Resources (GADNR) air permit application forms and a permit application report containing the following:

- A description of the project including air emission sources and pollution control equipment, presented in Section 2.0
- A regulatory applicability analysis of the proposed project, presented in Section 3.0
- Air toxics impact analysis, presented in Section 4.0

Supporting documents and emissions calculations are presented in the appendices.

2.0 PROJECT DESCRIPTION

2.1 General

The proposed facility, which will be known as the Wiregrass Plant, will be located in Lowndes County, Georgia, approximately 3 miles southeast of Valdosta, Georgia, on State Road 94. The general location of the facility is presented in Figure 2-1. A property map of the Wiregrass Plant is presented in Figure 2-2. The property encompasses approximately 24 acres of land.

2.2 Facility Description

A plot plan of the Wiregrass Plant is presented in Figure 2-3, showing the location of the proposed BFB boiler. Approximately 1 acre of the plant site will be used for the power block. The property boundary surrounding the plant is also shown in Figure 2-3. The area surrounding the site is mostly rural. A transmission line corridor is located approximately 0.5 mile east of the site.

The site elevation is nominally 180 feet (ft) with respect to the national geodetic vertical datum of 1929 (NGVD 29). The terrain surrounding the site is mostly flat and the elevation changes only about ±30 ft within a radius of 3 miles surrounding the site.

2.2.1 Biomass Boiler

The proposed main boiler for the Wiregrass Plant will be a BFB-type, combusting approximately 99.5-percent wood waste and 0.5-percent sludge obtained from Valdosta's Mud Creek Wastewater Treatment Plant. It will be permitted for 8,760 hr/yr operation. Fuel characteristics are presented in Appendix A of this report. The minimum expected combustion efficiency for the boiler is 70 percent in the normal operating mode.

Fluidized bed combustion (FBC) is a combustion technology where solid fuels are suspended on upward-blowing jets of air during the combustion process. The result is a turbulent mixing of gas and solids. The tumbling action, much like a bubbling fluid, provides more effective chemical reactions and heat transfer. BFB boilers typically allow a wide range of fuels to be burned, separately or in combination, and are normally selected for burning fuels with lower heating values such as biomass. Due to the low-temperature combustion processes that occur in the bubbling bed, the generation of NO_x emissions is inherently low. Due to the intimate contact between the bed material and the fuel, improved fuel burnout occurs, which results in low CO and VOC emissions. The improved carbon burnout also allows the use of post-combustion control technologies such as a SCR system to further reduce NO_x emissions and baghouses to reduce PM emissions.

The proposed boiler furnace will be complete with seven fuel feeders; a high-performance overfire air system that includes upper and lower overfire air nozzles, overfire air supply ducts, dampers, and an overfire air fan; soot blowers; fluidized air supply duct; forced draft fan; and booster fan. The boiler will also have a multi-stage air heater and economizer. A process flow diagram of the proposed plant's power island is shown in Figure 2-4.

The primary fuel for the boiler will be biomass, with natural gas used for startup. The boiler will have two 60-MMBtu/hr natural gas burners. The heat input of the boiler during startup is limited to 120 MMBtu/hr. The biomass will consist of 95-percent wood waste and 5-percent sludge and will have a low heating value of 4,300 British thermal units per pound (Btu/lb) of biomass. The maximum design heat input rate of the boiler firing biomass during normal operation at 100-percent load is 626 MMBtu/hr, corresponding to a steam production rate of 402,600 lb/hr.

The BFB boiler for this project will use a SCR to minimize emissions of NO_x. Low-NO_x burners will be utilized for reducing NO_x emissions during natural gas firing during startup. Fabric filter baghouses will be used for control of PM and metals emissions. An in-duct dry sorbent injection system will be used to control SO_2 and HCl emissions. Either hydrated lime (calcium hydroxide) or trona (natural sodium carbonate/sodium bicarbonate) will be used as sorbent. An oxidation catalyst system will be used to control CO and VOC emissions. The wood biomass fuel will have very low Pb and Hg content, which will result in low Pb and Hg emissions.

The boiler will be fitted with soot blowers for each economizer module. It is anticipated that the soot blowers will be used once every 8-hour shift. The duration of soot blowing will be approximately 60 minutes. It is anticipated that opacity and particulate emissions will increase during the operation of the soot blowers. Although it is not possible to quantify the magnitude of emissions during soot blowing, Wiregrass Power, LLC is requesting a higher opacity limit for soot blowing periods, not to exceed 3 hours per day.

The boiler will have an underbed ash removal system. This system will consist of bottom-supported hoppers that isolate the bubbling bed foundation and steel from the boiler steel. The ash and other tramp material moves down between the bubble caps in the bubbling bed and cools before being removed through the bottom hoppers. Ash will be conveyed from these sources and mixed prior to being conveyed to the ash silo. From the ash silo, the ash is loaded into trucks for delivery to a permitted ash disposal facility. A conditioning system wets the ash upon discharging to the trucks to minimize fugitive dust emissions.

2.2.2 Biomass Handling System

The Wiregrass Plant will receive woody biomass material in the form of wood chips delivered by truck. Up to 0.5 percent of the heat input to the biomass boiler will be from sludge obtained from Valdosta's Mud Creek Wastewater Treatment Plant.

All trucks will be weighed upon entering and leaving the facility. The wood chips will be unloaded using truck dumps. Wood from the truck dumps will be sent by conveyors to a screen and hog tower where the material will be sized. Properly sized material will then be sent to a wood storage pile via a storage conveyor and radial stacker. Another conveying system will transport the wood chips to the wood storage bins that will feed the boiler.

A process flow diagram for the biomass handling system is presented in Figures 2-5a and 2-5b.

2.2.3 Ash Handling System

Wood ash will be collected at the bottom of the boiler (bottom ash) and will be conveyed to an ash storage silo with vent filter and ash conditioner for truck discharge. The ash will be loaded into trucks using a telescoping chute. Trucks will then transport the ash to a disposal site or to a customer for beneficial use (fertilizer, road foundation aggregate, etc.). Fly ash is the particulates captured by the fabric filter baghouse, which will also be conveyed to the ash silo.

2.2.4 Cooling Tower

The Wiregrass Plant will have one cooling tower comprising three cells. The cooling tower will be used to provide cool water to the condensing steam turbine. The tower will be a mechanical draft counter-flow design and will be equipped with drift eliminators. Drift eliminators use inertial separation caused by airflow direction changes to remove water droplets from the airstream exhausting from the cooling tower.

2.2.5 Diesel Fire Pump Engine

The 150- horsepower (hp) diesel fire pump engine will be used in case of fire. Weekly operational testing will be necessary to comply with fire protection codes. Operation will be strictly limited to periodic reliability testing as may be required by prudent practices and applicable codes and standards and under actual emergency conditions for total operating hours not to exceed 60 hr/yr.

2.3 Air Pollution Control Equipment

The exhaust gases from the boiler will be treated using the following air pollution control equipment:

- SCR system to control NO_x emissions
- Oxidation catalyst system to control CO emissions
- Fabric filter and cyclone to control PM emissions
- In-duct dry sorbent injection system to control acid gases

The locations of the control equipment are shown in Figure 2-4.

In addition to these add-on control technologies, the boiler will employ “good combustion practices” (GCPs). The fuel-air ratio will be controlled by adjusting the air flow to the lower and upper overfire air nozzles.

Drift eliminators will be used to reduce cooling tower drift and control PM emissions. Baghouses will be used to control PM emissions from the ash silo. A cyclone will be used to control PM emissions from the hog tower. Periodic water spray will be used to reduce fugitive dust emissions from the biomass storage pile caused by wind erosion.

2.4 Air Emissions

2.4.1 BFB Boiler

The maximum short-term and annual emissions for the boiler are presented in Tables 2-1 through 2-3. The maximum short-term emissions for biomass firing and natural gas firing during startup alone are also provided. Emissions of PM/PM_{10}, SO_2, NO_x, CO, VOC, and HCl for wood biomass combustion are based on guaranteed emission factors by the control technology vendors, which are summarized below:

- PM/PM_{10} – 0.025 pound per million British thermal units (lb/MMBtu)
- SO_2 – 0.09 lb/MMBtu
- NO_x – 0.09 lb/MMBtu
- CO – 0.09 lb/MMBtu
- VOC – 0.022 lb/MMBtu
- HCl – 0.003 lb/MMBtu

Emissions of $PM_{2.5}$ are estimated from US Environmental Protection Agency (EPA) publication AP-42 (Section 1.6, Wood Residue Combustion in Boilers), which states that $PM_{2.5}$ emissions are 65 percent of PM_{10} emissions for wood-fired boilers equipped with a fabric filter. For $PM_{2.5}$, the proposed limit is 0.0163 lb/MMBtu for wood biomass fuel.

Emissions of Pb and Hg are a function of the Pb and Hg content of the biomass fuel burned. Based on the fuel analysis presented in Appendix A, the proposed Pb and Hg emissions limits for biomass firing are $3.8x10^{-4}$ lb/MMBtu and $2.3x10^{-8}$ lb/MMBtu, respectively.

Emissions of SAM are a function of SO_2 emissions. The maximum short-term emissions are based on a factor of 5 percent of SO_2 emissions. This factor is based on AP-42, which states that during fuel oil burning, 1 to 5 percent of SO_2 is further oxidized to sulfur trioxide (SO_3). It is then assumed that all the SO_3 converts to sulfuric acid (H_2SO_4). It should be noted that AP-42 does not provide any SO_2 to SO_3 conversion rate for wood residue combustion.

The maximum short-term emissions for natural gas combustion during startup are based on maximum heat input rate of 120 MMBtu/hr (2 burners each at 60 MMBtu/hr) and AP-42 emissions factors (Section 1.4, Natural Gas Combustion) except for NO_x, CO, and VOC. Emissions factors for NO_x, CO, and VOC are based on typical start-up data provided by the boiler manufacturer. The maximum annual average emissions for the boiler were estimated for two scenarios: 100-percent biomass firing and maximum natural gas firing during startup for 500 hours with remainder of the year firing biomass.

The maximum short-term and annual HAP emissions rates are presented in Table 2-3. HAPs emissions factors for biomass firing are based on the following sources:

- Biomass fuel analysis for total suspended metals
- AP-42 Section 1.6, Wood Residue Combustion in Boilers
- National Council for Air and Stream Improvement (NCASI) emission factors established in Table 20A (VOC) and Table 20B (Trace Metals), Technical Bulletin No. 858
- Draft Air Permit for a 675-MMBtu/hr wood biomass-fired BFB or stoker boiler, Loblolly Green Power, LLC, South Carolina Permit Number 1780-0051CA, September 3, 2009
- Stack test results for wood-fired boilers

HAP emissions factors for natural gas firing are based on AP-42 Section 1.4, Natural Gas Combustion.

Control efficiency of organic compounds is based on the control efficiency of the oxidation catalyst system. Control efficiency of trace elements is based on the control efficiency of the baghouse.

The proposed boiler will meet all emission limits imposed by the New Source Performance Standards (NSPS) (see Section 3.1 for further discussion).

2.4.2 Biomass/Ash Materials Handling System

The potential short-term (24-hour average) and annual PM emissions from the proposed biomass and ash handling systems for the Wiregrass Plant were developed. The maximum amount of biomass burned in the proposed Wiregrass boiler is estimated at 637,650 tons per year (TPY) of wood. This throughput is based on the maximum boiler heat input rate of 626 MMBtu/hr and wood heat content of 4,300 Btu/lb.

The Wiregrass Plant will have a biomass handling system, which will include conveyors, a screen and hogger, stacker, wood storage pile etc. Fugitive and non-fugitive PM emissions will be generated from the following sources:

- Ash silo baghouse
- Hog tower cyclone
- Wind erosion of biomass storage pile
- Batch/continuous drop of material from various material handling operations including the stacker discharge
- Screening and crushing operations
- Vehicular traffic on paved and unpaved roads
- Bulldozing activities near the biomass storage pile

Wiregrass Power, LLC will employ several fugitive dust control techniques, including the inherent moisture content of the wood fuel, watering of storage piles, and watering of haul roads. Control efficiencies for these measures were based on published data.

The maximum short-term and annual PM emissions from the ash silo baghouse and hog tower cyclone are based on actual air flow rates and manufacturer-specified dust loading of the exhaust air. These emissions are presented in Table 2-4. The maximum short-term and annual fugitive PM emissions due to material handling operations, which include wind erosion, bulldozing, screening, and batch/continuous drop operations, are presented in Table 2-5. Emission factors are based primarily on EPA AP-42 emission factors. Moisture content of wood is based on fuel analysis data.

Detailed information on the fugitive dust calculations, equations used, and reference materials are presented in Appendix B.

2.4.3 Truck Traffic

The wood biomass fuel will be delivered to the Wiregrass Plant by trucks. The ash will also be transported out of the plant by trucks. This traffic will travel over primarily paved roads on the plant site, but will also utilize some unpaved roads.

Fugitive dust emissions associated with this traffic were estimated and are presented in Table 2-5. Emission factors were based on EPA AP-42 factors for paved and unpaved roads. Road silt content was based on the results of a sampling conducted at the plant site.

The maximum number of trucks is based on the total design maximum wood usage for the Wiregrass boiler, as well as ash disposal. Detailed calculations are presented in Appendix B.

2.4.4 Cooling Tower

The maximum 24-hour average and annual average PM emissions from the cooling tower are presented in Table 2-6, based on maximum design water circulation of the tower, total dissolved solids (TDS) content of the water, and the drift elimination rate of the drift eliminators. It was conservatively assumed that 50 percent of PM emissions are PM_{10} and $PM_{2.5}$ emissions are equal to PM_{10} emissions.

2.4.5 Diesel Fire Pump Engine

The 150-hp diesel fire pump engine will be operated for routine testing, maintenance, and inspection purposes and under actual emergency conditions for total operating hours not to exceed 60 hr/yr.

The design and emissions data for the diesel fire pump engine are presented in Table 2-7.

Emission factors were based on EPA AP-42 factors and US emission standards for non-road diesel engines, Tier 3 certification, under NSPS, Subpart IIII.

2.4.6 Summary of Annual Emissions

A summary of annual emissions from the proposed Wiregrass Plant is presented in Table 2-8.

2.5 Monitoring

Monitoring of steam production, fuel rates, air pollutant emissions, and air pollution control device parameters will be performed for the boiler operation. The wood feed rate and the boiler heat input rate will be determined consistent with standard industry practice. It is not practical or accurate to directly weigh the amount of biomass fuel entering the boiler. Therefore, the boiler heat input rate will be determined by continuously measuring steam production rate, steam pressure and temperature, and feed-water temperature, and using this information to calculate the heat input rate.

Heat input rate to the boiler will be determined on an hourly basis. First, using the steam and feed-water enthalpies and steam production rate, the heat content of the steam will be determined. Any heat input to the boiler due to natural gas will then be determined using fuel rate measurements. The design efficiency for natural gas firing of 80 percent will be used to determine the amount of fossil fuel heat input entering the steam. The remaining heat content of the steam is due to biomass firing. Using the design thermal efficiency of 70 percent for wood, the heat input rate due to biomass will be determined using the design fuel heating values of 4,300 Btu/lb (wet basis) for wood.

Air pollutant emission rates for SO_2, NO_x, and CO will be continuously monitored using continuous emission monitoring systems (CEMS). A continuous opacity monitoring system (COMS) will also be installed on the boiler stack. A data acquisition system (DAS) will be maintained recording and storing all monitoring data.

3.0 AIR QUALITY REVIEW REQUIREMENTS

Based on federal and Georgia requirements, an air construction permit is needed from the Georgia Environmental Protection Division (Georgia EPD) before the proposed Wiregrass Plant can be constructed. The proposed facility will be located in Lowndes County, which is designated as an attainment area for all regulated air pollutants. If a proposed stationary source will have the "potential to emit" more than 100 TPY of any pollutant regulated under the Clean Air Act (CAA), then it will be subject to Prevention of Significant Deterioration (PSD) NSR, provided that the source falls within one of the 28 listed source categories found in Title 40, Part 52.21(b)(1)(i)(a) of the Code of Federal Regulations [40 CFR 52.21(b)(1)(i)(a)]. Because the proposed biomass facility does not fall within one of the 28 listed source categories, the emission rate threshold for triggering PSD NSR is 250 TPY. As shown in Section 2.0, because the proposed Wiregrass Plant's annual emissions will be less than 250 TPY, it will be a minor source of air pollutants subject to minor source NSR.

Since PSD NSR is not applicable to the Wiregrass Plant, the additional analyses required under the PSD requirements, such as control technology review, source impact analysis, air quality analysis (monitoring), source information, and additional impact analysis, are not required.

Since Lowndes County is an attainment area for all regulated air pollutants, nonattainment NSR requirements are not applicable to the Wiregrass Plant.

3.1 Emission Standards

3.1.1 New Source Performance Standards

The NSPS are a set of national emission standards that apply to specific categories of new sources. As stated in the CAA Amendments of 1977, these standards "shall reflect the degree of emission limitation and the percentage reduction achievable through application of the best technological system of continuous emission reduction the Administrator determines has been adequately demonstrated." The following describes NSPS that are potentially applicable to the proposed biomass boiler.

Subpart Db

The proposed boiler is subject to 40 CFR 60, NSPS Subpart Db, standards of performance for industrial-commercial-institutional steam generating unit for which construction, modification or reconstruction commenced after June 19, 1989. It applies to boilers with a heat input capacity of greater than 100 MMBtu/hr.

Under Subpart Db, the applicable limit for PM emissions is 0.030 lb/MMBtu for boilers combusting fuel oil or wood and for which construction commenced after February 28, 2005 [Section 60.43b(h)].

There is no emission limit for SO_2 for boilers firing wood. The applicable opacity standard is contained in 40 CFR 60.43b(f), and is 20-percent opacity (6-minute average), except 27-percent opacity is allowed for one 6-minute period per hour.

Subpart Db contains NO_x emission standards for fossil fuel firing. There are no specific standards for wood firing; however, when burning natural gas in combination with wood, the applicable standard for natural gas firing alone must be met. The applicable standard for natural gas-firing units is 0.30 lb/MMBtu. However, there is an exemption from this standard provided that fossil fuel firing does not exceed a 10-percent annual capacity factor for the unit [40 CFR 60.44b(l)(1)]. A continuous NO_x emissions monitor is also required for sources subject to the NO_x standard. As currently designed, the proposed biomass boiler will fire fossil fuel at a rate equivalent to less than the 10-percent annual capacity factor. As such, a NO_x emission standard pursuant to this NSPS is assumed to not apply to this unit.

Subpart Db also contains continuous opacity monitoring requirements for any unit subject to the opacity standard under 60.43b(f) [refer to 63.48b(a)].

Subpart IIII

The applicable NSPS for the diesel fire pump engine is 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Emission limits have been established for NO_x, Non-Methane Hydrocarbons (NMHC), CO, and PM depending on the type of engine, model year, and maximum engine power.

3.1.2 National Emission Standards for Hazardous Air Pollutants

The EPA has issued National Emission Standards for Hazardous Air Pollutants (NESHAPs) for various source categories under 40 CFR 63. These standards are referred to as Maximum Achievable Control Technology (MACT) standards because they require that MACT be applied to control the emissions of HAPs. The proposed facility will emit HAPs at levels that are below the major source threshold. As such, 40 CFR 63 will not apply to this facility.

3.1.3 Acid Rain Program

The 1990 CAA Amendments established a program to reduce potential precursors of acidic deposition. The Acid Rain Program was delineated in Title IV of the CAA Amendments and required EPA to develop the program. EPA's final regulations were promulgated on January 11, 1993, and included permit provisions (40 CFR 72), an allowance system (40 CFR 73), continuous emission monitoring (40 CFR 75), excess emission procedures (40 CFR 77), and appeal procedures (40 CFR 78). The Georgia EPD has implemented rules that are consistent with the federal permit regulations applicable to facilities affected by the requirements of Title IV of the CAA Amendments.

EPA's Acid Rain Program applies to all existing and new utility units except those serving a generator less than 25 MW, existing simple cycle combustion turbines, and certain non-utility facilities. Units that fall under the program are referred to as affected units. The EPA regulations are applicable to the proposed Wiregrass Plant for the purposes for obtaining a permit and allowances, as well as emission monitoring. New units are required to obtain permits under the program by submitting a complete application 24 months before January 1, 2000, or the date on which the unit begins serving an electric generator greater than 25 MW, whichever is later. An Acid Rain Permit application is submitted in Attachment B of this permit application package.

The Acid Rain (Title IV) permit will provide SO_2 and NO_x emission limitations and the requirement to hold SO_2 emission allowances. An allowance is a market-based financial instrument that is equivalent to 1 ton of SO_2 emissions. Allowances can be sold, purchased, or traded. For the proposed Wiregrass Plant, SO_2 allowances will be obtained from the market. There is currently no NO_x allowance trading program in place.

Continuous emission monitoring (CEM) for SO_2 and NO_x is required for gas- and oil-fired affected units. SO_2 emissions for natural gas may be determined using procedures established in Appendix D, 40 CFR 75. carbon dioxide (CO_2) emissions must also be determined either through a CEM (e.g., as a diluent for NO_x monitoring) or calculation. Alternate procedures, test methods, and quality assurance/quality control (QA/QC) procedures for CEM are specified in 40 CFR 75 Appendices A through I. New units are required to meet the requirements by January 1, 1995, or not later than 90 days after the unit commences commercial operation, whichever is later. The Wiregrass Plant will be required to either install CEMs for NO_x or establish predictive emission monitors (PEMs) to meet the Part 75 requirements.

3.1.4 Clean Air Interstate Rule

The Clean Air Interstate Rule (CAIR) was promulgated under 40 CFR 96 to reduce the emissions of precursor pollutants of ground-level ozone (O_3) and fine particulate formation, and therefore the interstate transport of O_3 and fine particulates. CAIR applies to electric utility steam generating units, and, by definition, the rule applies to the project's biomass boiler. CAIR regulates NO_x and SO_2 emissions. At this time, the legal status of CAIR is uncertain. CAIR was challenged in the US Court of Appeals, which vacated the rule, but it appears that the court's decision may be reconsidered or reviewed by the US Supreme Court.

3.1.5 Georgia Rules

The Georgia EPD regulations for existing and new stationary sources are covered in Chapter 391-3-1-.02. Chapter 391-3-1-.02(2)(d) presents emissions limitations and standards for fuel burning equipment with greater than 250 MMBtu/hr heat input and constructed after January 1, 1972. As stated, PM and visible emissions from such equipment are limited to 0.1 lb/MMBtu and 20-percent opacity, respectively.

NO_x emissions from such equipment are limited to 0.2 lb/MMBtu when firing natural gas. The proposed boiler will comply with these standards.

The Georgia EPD has adopted the EPA NSPS by reference in Chapter 391-3-1-.02(8), Subsection (b)4 for Industrial-Commercial-Institutional steam generating units. Therefore, the Wiregrass project must meet the same emissions, performance testing, monitoring, reporting, and record keeping requirements as those described in the EPA regulations. Georgia EPD has authority for implementing NSPS requirements in Georgia.

3.1.6 Georgia Air Permitting Requirements

The Georgia EPD regulations require any new facility that may emit air pollution to obtain an air permit prior to construction. The requirements for construction permits and approvals are contained in Chapter 391-3-1-.03(1), which states that the construction permit application must include and/or be accompanied by all pertinent information for a full evaluation of the proposed construction of the facility.

4.0 AIR TOXICS IMPACT ANALYSIS

An air toxics analysis was conducted for the proposed Wiregrass Plant to determine compliance with the Georgia EPD Air Quality Division (AQD) air toxic regulations. The analysis was performed for all HAPs that are expected to be emitted by the proposed facility. The air modeling analysis methodology was designed in accordance with the procedures outlined in the document, "Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions" (Georgia EPD, 1998). Following is a summary of the methodology used for the HAP modeling analysis.

4.1 Development of Air Toxic Criteria

Using the procedure outlined in the GADNR air toxic modeling guidelines document, Acceptable Ambient Concentrations (AAC) were developed for each emitted HAP compound. AACs were developed for the annual, 24-hour, and averaging times less than 24-hours using the procedures outlined in the guidelines. The AACs are presented in Table 4-1.

4.2 Air Dispersion Model

Per the Georgia EPD air toxics modeling guidelines, the Industrial Source Complex Short-Term (ISCST3) model was used for the HAP modeling analysis. The latest version of ISCST3 (Version 02035) was used to predict maximum concentrations at and beyond the proposed facility's fence line. The EPA default option was used. Because the land use within a 3-kilometer (km) radius of the proposed facility contains very little industrial, commercial or high-density residential land use, the rural mode dispersion coefficients were used for this analysis.

4.3 Source Information

The proposed boiler is the only source of HAP from the proposed facility. In accordance with the air toxics modeling guidelines, building data were excluded from the analysis. The location of the proposed boiler stack at the site is shown in Figure 2-3.

4.4 Modeling Approach

Maximum ground-level concentrations (MGLC) were determined using the ISCST3 model and a five-year hourly meteorological record for the annual, 24-hour, 8-hour, 3-hour and 1-hour averaging times. Based on Georgia EPD's air toxics modeling guidelines, 4-hour and 15-minute average concentrations were obtained on 1-hour average modeled concentration multiplying factors of 0.76 and 1.32, respectively, based on the ratio of specific averaging period to 1-hour period raised to 0.2 power. Generic MGLCs for the boiler were determined using an emission rate of 1 gram/second (g/s). The generic MGLCs were then multiplied by the pollutant-specific HAP emission rate to obtain pollutant-specific MGLC concentrations that can be compared directly to the applicable AAC for each applicable averaging time. For comparison to annual-average AAC, the pollutant- specific annual emissions in TPY were used. For comparison to AAC with averaging times of 24-hour or less, the maximum emissions in lb/hr were used.

4.5 Meteorological Data

The air modeling analysis used 5 years of coincident surface data from the National Weather Service (NWS) station in Tallahassee, Florida, coupled with twice-daily mixing height data from the NWS station in Waycross. The years of record were 1982 to 1986. The surface and upper air meteorological data were obtained from the AQD's internet website. An anemometer height of 25 feet was used. These data were obtained from the Georgia EPD website.

4.6 Receptors

A grid consisting of 10,220 Cartesian receptors were used to predict maximum concentrations. The grid consisted of receptors spaced at 50-meter intervals located along the proposed facility's fence line and receptors beyond the fence line out to 5.0 km that are spaced at 100-meter intervals. The receptor grid was extended to a distance of 5.0 km from the proposed facility such that the maximum predicted concentrations for each averaging time were predicted within the receptor grid. Receptor elevation data were calculated using 7.5-minute digital elevation model obtained from the US Geographical Survey website. The terrain data were extracted using the preprocessor program AERMAP, Version 09040.

4.7 Air Modeling Results

The HAP screening air modeling results are summarized in Table 4-2. Based on the screening results, all HAP emissions were determined to be below the AAC.

TABLES

TABLE 2-1
MAXIMUM SHORT-TERM EMISSIONS FOR THE BFB BOILER
WIREGRASS PLANT

Regulated Pollutant	Biomass			Natural Gas [e]			Maximum Emissions for any fuel (lb/hr)
	Emission Factor [a] (lb/MMBtu)	Boiler Heat Input[b] (MMBtu/hr)	Maximum Emissions (lb/hr)	Emission Factor [a] (lb/MMBtu)	Boiler Heat Input[b] (MMBtu/hr)	Maximum Emissions (lb/hr)	
Particulate (PM)	0.025	626.0	15.7	0.0076 [d]	120	0.9	15.7
Particulate (PM_{10})	0.025	626.0	15.7	0.0076 [d]	120	0.9	15.7
Particulate ($PM_{2.5}$)	0.0163 [c]	626.0	10.2	0.0076 [d]	120	0.9	10.2
Sulfur Dioxide	0.09	626.0	56.3	0.0006 [d]	120	0.07	56.3
Nitrogen Oxides	0.09	626.0	56.3	0.12 [i]	120	14.4	56.3
Carbon Monoxide	0.09	626.0	56.3	0.15 [i]	120	18.0	56.3
Volatile Organic Compounds (VOC)	0.022	626.0	13.8	0.017 [i]	120	2.0	13.8
Lead	3.77E-04 [f]	626.0	0.24	5.0E-07 [d]	120	6.0E-05	0.2
Mercury	2.3E-08 [f]	626.0	0.000014	2.6E-07 [d]	120	3.1E-05	3.1E-05
Fluorides	7.0E-04 [g]	626.0	0.44	--	--	--	0.44
Sulfuric Acid Mist (SAM)	0.0055 [h]	626.0	3.5	0.00004 [h]	120	4.4E-03	3.5

[a] Based on proposed emissions limits, unless otherwise noted, ESI, Inc.
[b] Maximum design heat input, ESI, Inc.
[c] Based on wood residue combustion, Section 1.6, AP-42, September 2003; 65 percent of PM emissions.
[d] Natural gas combustion, Section 1.4, AP-42, July 1998. Natural gas heat content is 1,000 Btu/ft^3.
[e] Natural gas used during startup only. Natural gas burner maximum heat input is 120 MMBtu/hr, ESI, Inc.
[f] Based on biomass fuel analysis, see Appendix A.
[g] Based on maximum stack test data from firing wood or bagasse at Okeelanta Corporation Sugar Mill & Refinery New Hope Power Cogeneration Plant (Florida Facility ID 0990005) (1999-2001).
[h] Based on AP-42 Section 1.3 for fuel oil burning - 5% (1 to 5%) of the SO_2 is further oxidized to SO_3, which then convert to SAM (98/80).
[i] Based on typical start-up burner data from Babcock & Wilcox, ESI, Inc.

Checked by: SLM
Reviewed by: [signature]

TABLE 2-2
ANNUAL EMISSIONS FOR THE BFB BOILER
WIREGRASS PLANT

Regulated Pollutant	Biomass Hourly Emissions [a] (lb/hr)	Biomass Operating Hours (hrs/yr)	Biomass Annual Emissions (TPY)	Natural Gas Hourly Emissions [a] (lb/hr)	Natural Gas Operating Hours (hrs/yr)	Natural Gas Annual Emissions (TPY)	Total Annual Emissions [b] (TPY)
Biomass Firing Only							
Particulate (PM)	15.65	8,760	68.5	--	--	--	68.5
Particulate (PM10)	15.65	8,760	68.5	--	--	--	68.5
Particulate (PM2.5)	10.17	8,760	44.6	--	--	--	44.6
Sulfur Dioxide	56.34	8,760	246.8	--	--	--	246.8
Nitrogen Oxides	56.34	8,760	246.8	--	--	--	246.8
Carbon Monoxide	56.34	8,760	246.8	--	--	--	246.8
Volatile Organic Compounds (VOC)	13.77	8,760	60.3	--	--	--	60.3
Lead	0.24	8,760	1.0	--	--	--	1.03
Mercury	0.000014	8,760	0.000063	--	--	--	0.000063
Fluorides	0.44	8,760	1.9	--	--	--	1.92
Sulfuric Acid Mist (SAM)	3.45	8,760	15.1	--	--	--	15.1
Normal Operation Including Startup							
Particulate (PM)	15.65	8,260	64.6	0.9	500	0.2	64.9
Particulate (PM10)	15.65	8,260	64.6	0.9	500	0.2	64.9
Particulate (PM2.5)	10.17	8,260	42.0	0.9	500	0.2	42.2
Sulfur Dioxide	56.34	8,260	232.7	0.1	500	0.0	232.7
Nitrogen Oxides	56.34	8,260	232.7	14.4	500	3.6	236.3
Carbon Monoxide	56.34	8,260	232.7	18.0	500	4.5	237.2
Volatile Organic Compounds (VOC)	13.77	8,260	56.9	2.0	500	0.5	57.4
Lead	0.24	8,260	1.0	6.0E-05	500	1.5E-05	1.0
Mercury	0.000014	8,260	0.000059	3.1E-05	500	7.8E-06	0.000067
Fluorides	0.44	8,260	1.8	--	--	--	--
Sulfuric Acid Mist (SAM)	3.45	8,260	14.3	4.4E-03	500	1.1E-03	14.3

[a] Refer to Table 2-1 for basis of hourly emissions.
[b] Denotes maximum for any fuel combination.

Checked by: SLM
Reviewed by: Rey

TABLE 2-3
HAZARDOUS AIR POLLUTANT EMISSION FACTORS AND EMISSIONS FOR THE BFB BOILER
WIREGRASS PLANT

Heat Input (MMBtu/hr), biomass firing =	626	
Heat Input (MMBtu/hr), natural gas firing (startup) =	120	
Hourly natural gas consumption ($MMft^3/hr$) =	0.120	Based on natural gas heat content of 1,000 Btu/ft^3.
Annual Operating Hours =	8,760	
Annual Startup Hours =	500	

		Biomass Firing					Natural Gas Firing					Maximum	Annual Rate	
Pollutant	CAS No.	Emission Factor	Units	Ref.	Control Eff. [7]	lb/hr	Emission Factor	Units	Ref.	Control Eff. [7]	lb/hr	Hourly Rate (lb/hr)	Biomass Only (TPY)	Biomass & NG (TPY)
Acetaldehyde	75-07-0	1.9E-04	lb/MMBtu	4	55%	5.4E-02	ND	--	--	0%	--	5.4E-02	2.3E-01	2.2E-01
Acetophenone	98-86-2	3.2E-09	lb/MMBtu	2	55%	9.0E-07	ND	--	--	0%	--	9.0E-07	3.9E-06	3.7E-06
Acrolein	107-02-8	7.8E-05	lb/MMBtu	4	55%	2.2E-02	ND	--	--	0%	--	2.2E-02	9.6E-02	9.1E-02
Antimony		7.9E-06	lb/MMBtu	2	99%	4.9E-05	ND	--	--	0%	--	4.9E-05	2.2E-04	2.0E-04
Arsenic		2.74E-04	lb/MMBtu	1	99%	1.7E-03	2.0E-04	lb/MMCF	6	99%	2.4E-07	1.7E-03	7.5E-03	7.1E-03
Benzene	71-43-2	3.30E-04	lb/MMBtu	5	55%	9.3E-02	2.10E-03	lb/MMCF	6	55%	1.1E-04	9.3E-02	4.1E-01	3.8E-01
Beryllium		0.00E+00	lb/MMBtu	1	99%	0.0E+00	1.2E-05	lb/MMCF	6	99%	1.4E-08	1.4E-08	0.0E+00	3.6E-09
Bis(2-ethylhexyl)phthalate	117-81-7	4.70E-08	lb/MMBtu	2	55%	1.3E-05	ND	--	--	0%	--	1.3E-05	5.8E-05	5.5E-05
Cadmium		3.49E-07	lb/MMBtu	1	99%	2.2E-06	1.1E-03	lb/MMCF	6	99%	1.3E-06	2.2E-06	9.6E-06	9.3E-06
Carbon Tetrachloride	56-23-5	4.50E-05	lb/MMBtu	2	55%	1.3E-02	ND	--	--	0%	--	1.3E-02	5.6E-02	5.2E-02
Chlorine	7782-50-5	7.90E-04	lb/MMBtu	2	55%	2.2E-01	ND	--	--	0%	--	2.2E-01	9.7E-01	9.2E-01
Chlorobenzene	108-90-7	3.30E-05	lb/MMBtu	2	55%	9.3E-03	ND	--	--	0%	--	9.3E-03	4.1E-02	3.8E-02
Chloroform	67-66-3	2.80E-05	lb/MMBtu	2	55%	7.9E-03	ND	--	--	0%	--	7.9E-03	3.5E-02	3.3E-02
Chromium		4.98E-04	lb/MMBtu	1	99%	3.1E-03	1.4E-03	lb/MMCF	6	99%	1.7E-06	3.1E-03	1.4E-02	1.3E-02
Chromium+6		3.50E-06	lb/MMBtu	2	99%	2.2E-05	ND	--	--	0%	--	2.2E-05	9.6E-05	9.0E-05
Cobalt		6.50E-06	lb/MMBtu	2	99%	4.1E-05	8.4E-05	lb/MMCF	6	99%	1.0E-07	4.1E-05	1.8E-04	1.7E-04
Dibenzofurans	132-64-9	8.40E-10	lb/MMBtu	2	55%	2.4E-07	ND	--	--	0%	--	2.4E-07	1.0E-06	9.8E-07
1,2 - Dichloroethane (ethylene dichloride)	107-06-2	2.90E-05	lb/MMBtu	2	55%	8.2E-03	ND	--	--	0%	--	8.2E-03	3.6E-02	3.4E-02
2,4 - Dinitrophenol	51-25-8	1.80E-07	lb/MMBtu	2	55%	5.1E-05	ND	--	--	0%	--	5.1E-05	2.2E-04	2.1E-04
Ethylbenzene	100-41-4	3.10E-05	lb/MMBtu	2	55%	8.7E-03	ND	--	--	0%	--	8.7E-03	3.8E-02	3.6E-02
Formaldehyde	50-00-0	4.74E-04	lb/MMBtu	5	55%	1.3E-01	7.5E-02	lb/MMCF	6	55%	4.1E-03	1.3E-01	5.8E-01	5.5E-01
n-Hexane		ND	--	--	--	--	1.8E+00	lb/MMCF	6	55%	9.7E-02	9.7E-02	0.0E+00	2.4E-02
Hydrogen Chloride	7647-01-0	3.00E-03	lb/MMBtu	1	0%	1.9E+00	ND	--	--	0%	--	1.9E+00	8.2E+00	7.8E+00
Hydrogen Fluoride	7664-39-3	7.00E-04	lb/MMBtu	3	0%	4.4E-01	ND	--	--	0%	--	4.4E-01	1.9E+00	1.8E+00
Lead-Total		3.77E-04	lb/MMBtu	1	99%	2.4E-03	5.0E-04	lb/MMCF	6	99%	6.0E-07	2.4E-03	1.0E-02	9.7E-03
Manganese		0.00E+00	lb/MMBtu	1	99%	0.0E+00	3.8E-04	lb/MMCF	6	99%	4.6E-07	4.6E-07	0.0E+00	1.1E-07
Mercury		2.33E-08	lb/MMBtu	1	99%	1.5E-07	2.6E-04	lb/MMCF	6	99%	3.1E-07	3.1E-07	6.4E-07	6.8E-07
Methyl Bromide (bromomethane)	74-83-9	1.50E-05	lb/MMBtu	2	55%	4.2E-03	ND	--	--	0%	--	4.2E-03	1.9E-02	1.7E-02
Methyl Chloride (chloromethane)	74-87-3	2.30E-05	lb/MMBtu	2	55%	6.5E-03	ND	--	--	0%	--	6.5E-03	2.8E-02	2.7E-02
Methyl Ethyl Ketone	78-93-3	5.40E-06	lb/MMBtu	2	55%	1.5E-03	ND	--	--	0%	--	1.5E-03	6.7E-03	6.3E-03
Methylene Chloride (dichloromethane)	75-09-2	2.90E-04	lb/MMBtu	2	55%	8.2E-02	ND	--	--	0%	--	8.2E-02	3.6E-01	3.4E-01
Nickel		2.19E-04	lb/MMBtu	1	99%	1.4E-03	2.1E-03	lb/MMCF	6	99%	2.5E-06	1.4E-03	6.0E-03	5.7E-03
4 - Nitrophenol	100-02-7	1.10E-07	lb/MMBtu	2	55%	3.1E-05	ND	--	--	0%	--	3.1E-05	1.4E-04	1.3E-04
Pentachlorophenol	87-86-5	5.10E-08	lb/MMBtu	2	55%	1.4E-05	ND	--	--	0%	--	1.4E-05	6.3E-05	5.9E-05
Perchloroethylene (tetrachloroethylene)	127-18-4	5.20E-05	lb/MMBtu	4	55%	1.5E-02	ND	--	--	0%	--	1.5E-02	6.4E-02	6.0E-02
Phenols	108-95-2	5.10E-05	lb/MMBtu	2	55%	1.4E-02	ND	--	--	0%	--	1.4E-02	6.3E-02	5.9E-02
Phosphorus	7723-14-0	2.70E-05	lb/MMBtu	2	99%	1.7E-04	ND	--	--	0%	--	1.7E-04	7.4E-04	7.0E-04
Propylene dichloride (1,2 dichloropropane	78-87-5	3.30E-05	lb/MMBtu	2	55%	9.3E-03	ND	--	--	0%	--	9.3E-03	4.1E-02	3.8E-02
Propionaldehyde	123-38-6	6.10E-05	lb/MMBtu	2	55%	1.7E-02	ND	--	--	0%	--	1.7E-02	7.5E-02	7.1E-02
Selenium		0.00E+00	lb/MMBtu	1	99%	0.0E+00	2.4E-05	lb/MMCF	6	99%	2.9E-08	2.9E-08	0.0E+00	7.2E-09
Styrene	100-42-5	1.04E-04	lb/MMBtu	5	55%	2.9E-02	ND	--	--	0%	--	2.9E-02	1.3E-01	1.2E-01
2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin	1746-01-6	8.60E-12	lb/MMBtu	2	55%	2.4E-09	ND	--	--	0%	--	2.4E-09	1.1E-08	1.0E-08
Toluene	108-88-3	8.60E-12	lb/MMBtu	2	55%	2.4E-09	3.4E-03	lb/MMCF	6	55%	1.8E-04	1.8E-04	1.1E-08	4.6E-05
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	3.10E-05	lb/MMBtu	2	55%	8.7E-03	ND	--	--	0%	--	8.7E-03	3.8E-02	3.6E-02
Trichloroethylene	79-01-6	3.00E-05	lb/MMBtu	2	55%	8.5E-03	ND	--	--	0%	--	8.5E-03	3.7E-02	3.5E-02
2,4,6 - Trichlorophenol	88-06-2	2.20E-08	lb/MMBtu	2	55%	6.2E-06	ND	--	--	0%	--	6.2E-06	2.7E-05	2.6E-05
o-Xylene	95-47-6	2.50E-05	lb/MMBtu	2	55%	7.0E-03	ND	--	--	0%	--	7.0E-03	3.1E-02	2.9E-02
Vinyl Chloride	75-01-4	1.80E-05	lb/MMBtu	2	55%	5.1E-03	ND	--	--	0%	--	5.1E-03	2.2E-02	2.1E-02
Polycyclic Organic Matters (POMs)														
Acenaphthene	83-32-9	9.1E-07	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Acenaphthylene	208-96-8	5.0E-06	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Anthracene	120-12-7	3.0E-06	lb/MMBtu	2			2.40E-06	lb/MMCF	6					
Benzo(a)pyrene	50-32-8	2.6E-06	lb/MMBtu	2			1.20E-06	lb/MMCF	6					
Benzo(g,h,i)perylene	191-24-2	9.3E-08	lb/MMBtu	2			1.20E-06	lb/MMCF	6					
Benzo(a)anthracene	56-55-3	6.5E-08	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Benzo(b)fluoranthene	205-99-2	1.0E-07	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Benzo(k)fluoranthene	207-08-9	3.6E-08	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Chrysene	218-01-9	3.8E-08	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
Dibenzo(a,h)anthracene	53-70-3	9.1E-09	lb/MMBtu	2			1.20E-06	lb/MMCF	6					
Fluoranthene	206-44-0	1.60E-06	lb/MMBtu	2			3.0E-06	lb/MMCF	6					
Fluorene	86-73-7	3.40E-06	lb/MMBtu	2			2.8E-06	lb/MMCF	6					
Indeno(1,2,3-cd)pyrene	193-39-5	8.7E-08	lb/MMBtu	2			1.80E-06	lb/MMCF	6					
3 - Methylchloranthrene	56-49-5	ND	--	--		--	1.80E-06	lb/MMCF	6					
2 - Methylnapthalene	91-57-6	1.6E-07	lb/MMBtu	2			2.40E-05	lb/MMCF	6					
Naphthalene	91-20-3	9.70E-05	lb/MMBtu	2	55%	2.7E-02	6.1E-04	lb/MMCF	6	55%	3.3E-05	2.7E-02	1.2E-01	1.1E-01
Phenanthrene	85-01-8	7.00E-06	lb/MMBtu	2			1.7E-05	lb/MMCF	6					
Pyrene	129-00-0	3.70E-06	lb/MMBtu	2			5.0E-06	lb/MMCF	6					
Total POMs		1.25E-04	lb/MMBtu		55%	3.5E-02	6.82E-04	lb/MMCF		55%	3.7E-05	3.5E-02	1.5E-01	1.5E-01
												Total HAPs (TPY) =	**13.9**	**13.1**
												Max. Individual HAP (TPY) =	**8.2**	**7.8**

Note: ND - No Data,
1. Based on biomass fuel analysis (see Appendix A) - assuming all escape to the atmosphere.
2. Based on AP-42 emission factors for wood combustion (Section 1.6).
3. Based on maximum stack test data from firing wood or bagasse at the Okeelanta Corporation Sugar Mill & Refinery New Hope Power Cogeneration Plant (Florida Facility ID 0990005) (1999-2001).
4. Based on NCASI emission Factors established in Table 20A (VOC) and Table 20B (Trace Metals), Technical Bulletin No. 858.
5. Based on Draft Air Permit for a 675 MMBtu/hr wood biomass-fired bubbling fluidized bed (BFB) or stoker boiler, Loblolly Green Power, LLC, SC Permit Number 1780-0051CA, September 3, 2009.
6. Based on AP-42 emission factors for natural gas combustion (Section 1.4).
7. Control efficiency of organic compounds based on the control efficiency of the oxidation catalyst system; control efficiency of trace elements based on the control efficiency of the baghouse, ESI, Inc.

Checked by: [signature]
Reviewed by: [signature]

TABLE 2-4
ESTIMATION OF PM EMISSION RATES FOR ASH SILO BAGHOUSE AND HOG TOWER CYCLONE
WIREGRASS PLANT

Parameters			Ash Silo Baghouse	Hog Tower Cyclone
Emission Point			BAG2	CYC
Operation Data				
Daily activity hours		Daily	24	24
Annual activity days		Annual	365	365
Material Throughput				
Air Flow Rate		ft3/min	2.0	10,000.0
		ft3/hr	120.0	600,000.0
Estimated Emission Rate (ER)				
Particulate Matter Dust Loading [a]		grains/ ft^3	0.02	0.10
PM ER	lb/hr		3.43E-04	8.6
	tons/yr		1.50E-03	37.5
PM_{10} ER	lb/hr		3.43E-04	8.6
	tons/yr		1.50E-03	37.5
$PM_{2.5}$ ER	lb/hr		3.43E-04	8.6
	tons/yr		1.50E-03	37.5

[a] Particulate matter dust loading based on design information, ESI, Inc.

Checked by: SM
Reviewed by: RCW

TABLE 2-5
MAXIMUM ANNUAL FUGITIVE DUST EMISSIONS FOR MATERIAL HANDLING OPERATIONS
WIREGRASS PLANT

SOURCE	Source ID	Type of Operation	M Moisture Content [a] (%)	U Wind Speed [b] (mph)	Uncontrolled Emission Factors PM (TSP) (lb/ton) [c]	PM_{10} (lb/ton) [c]	$PM_{2.5}$ (lb/ton) [c]	Control Type	Control Efficiency (%)	Controlled Emission Factors PM (TSP) (lb/ton)	PM_{10} (lb/ton)	$PM_{2.5}$ (lb/ton)	Activity Factor	Maximum Annual Emissions PM (TSP) (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)
Truck Dumps	MH1	Batch Drop	50	9.4	0.000059	0.000028	0.0000043	NONE	0	0.000059	0.000028	0.0000043	637,650 TPY [d]	0.019	0.009	0.0014
Conveyors #1-To-Conveyor #2	MH2	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Conveyors #2-To-Screen	MH3	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Screen	MH4	SCREENING	--	--	0.025 [k]	0.0087	0.0087 [k]	NONE	0	0.025000	0.008700	0.0087000	637,650 TPY [d]	7.971	2.774	2.774
Screen-To-Hogger	MH5	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Hogger	MH6	CRUSHING	--	--	0.0054 [k]	0.0024	0.0024 [k]	ENCLOSED	95	0.0003	0.00012	0.000120	637,650 TPY [d]	0.09	0.04	0.038
Hogger-To-Storage Conveyor (Conveyor #3)	MH7	Batch Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	318,825 TPY [e]	0.0005	0.0002	0.00003
Screen-To-Storage Conveyor (Conveyor #3)	MH8	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	318,825 TPY [e]	0.0005	0.0002	0.00003
Storage Conveyor (Conveyor #3)-To-Stacker/Reclaimer	MH9	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Stacker/Reclaimer-To-Wood Chip Storage Pile	MH10	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	WATERING	75	0.000015	0.000007	0.0000011	637,650 TPY [d]	0.005	0.002	0.0003
Underpile Reclaimers	MH11	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSED	95	0.0000030	0.0000014	0.0000002	637,650 TPY [d]	0.0009	0.0004	0.00007
Reclaimers-To-Conveyor #4	MH12	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Conveyor #4-To-Conveyor #5	MH13	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Conveyor #5-To-Drag Chain Conveyor	MH14	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Drag Chain Conveyor-To-Boiler Metering Bins	MH15	Batch Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	637,650 TPY [d]	0.001	0.0004	0.0001
Drag Chain Conv. Overflow-To-Return Conveyor #6	MH16	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	63,765 TPY [f]	0.0001	0.00004	0.00001
Return Conveyor #6-To-Storage Conveyor (Conveyor #3)	MH17	Continuous Drop	50	9.4	0.000059	0.000028	0.0000043	ENCLOSURE	95	0.000003	0.000001	0.0000002	63,765 TPY [f]	0.0001	0.00004	0.00001
Wood Chip Storage Pile [g]	MH18	Wind Erosion	--	--	--	--	--	WATERING	75	--	--	--	-- TPY	0.05	0.02	0.01
Bulldozer for Wood Chip Storage Pile Maintenance [h]	MH19	Bulldozing	--	--	--	--	--	NONE	0	--	--	--	-- TPY	5.29	0.89	0.56
Bulldozer at Truck Dumps [h]	MH20	Bulldozing	--	--	--	--	--	NONE	0	--	--	--	-- TPY	5.29	0.89	0.56
Wood Truck Traffic On Paved Roads [i]	MH21	Vehicular Traffic	--	--	--	--	--	NONE	0	--	--	--	-- TPY	10.10	1.97	0.29
Bulldozer for Wood Chip Storage Pile Maintenance [j]	MH22	Vehicular Traffic	--	--	--	--	--	WATERING	75	--	--	--	-- TPY	32.42	9.24	1.42
Bulldozer at Truck Dumps [j]	MH23	Vehicular Traffic	--	--	--	--	--	WATERING	75	--	--	--	-- TPY	32.42	9.24	1.42
TOTAL														28.8	6.6	4.2

Notes:

[a] Based on biomass fuel analysis data (see Appendix A), ESI, Inc.

[b] Based on the average of hourly wind speed data from NWS station in Tallahassee, Florida.

[c] Batch Drop and Continuous Drop Emission Factors are computed from AP-42 (USEPA, 2006) Section 13.2.4: E= k x 0.0032 x (U/5)^1.3 / (M/2)^1.4 lb/ton, where k = 0.74 for PM, 0.35 for PM10, and .053 for PM2.5.

[d] Based on annual fuel biomass consumption of 637,647 tons/yr (boiler heat input of 626 MMBtu/hr and fuel heating value of 4,300 Btu/lb), ESI, Inc.

[e] Assuming material throughput evenly split between the screen and the hogger.

[f] Assuming 10% of biomass is overfeed.

[g] Refer to Table B-1, Appendix B for calculation.

[h] See Table B-2 in Appendix B.

[i] See Table B-3 in Appendix B.

[j] See Table B-4 in Appendix B.

[k] Emission factor reference: AP-42 (USEPA, 2004) Section 11.19.2. $PM_{2.5}$ assumed to be equal to PM_{10}.

Checked by:
Reviewed by:

TABLE 2-6
PHYSICAL, PERFORMANCE, AND EMISSIONS DATA FOR THE MECHANICAL DRAFT COOLING TOWER WIREGRASS PLANT

Parameter	Values [a]
Physical Data	
Number of Cells	3
Deck Dimensions (ft)	
Length	96.7
Width	53.7
Height	30
Stack Dimensions	
Height (ft)	30
Stack Top Effective Inner Diameter per cell (ft)	28
Effective Diameter, all cells (ft)	48.5
Performance Data	
Circulating Water Flow Rate (CWFR) (gal/min)	33,248
Design Wet Bulb Temperature (°F)	
Design Hot Water Temperature (°F)	110
Design Cold Water Temperature (°F)	
Heat Rejected (MMBtu/hr)	
Design Air Flow Rate per cell (acfm)	1,121,000
Hours of Operation	8,760
Emission Data	
Drift Rate [b] (DR) (percent)	0.001
Total Dissolved Solids (TDS) Concentration (ppm)	50
Solution Drift [c] (SD) (lb/hr)	166
PM Drift [d] (lb/hr)	0.008
(TPY)	0.036
PM_{10} Drift	
PM_{10} Portion (percent) of PM Drift [e]	50
PM_{10} Emissions (lb/hr)	0.004
(TPY)	0.018
$PM_{2.5}$ Drift	
$PM_{2.5}$ Portion (percent) of PM Drift [e]	50
$PM_{2.5}$ Emissions (lb/hr)	0.004
(TPY)	0.018

Notes:
[a] Based on design information, ESI, Inc.
[b] Drift rate is the percent of circulating water.
[c] Includes water and based on circulating water flow rate and drift rate (CWFR x DR x 8.34 lb/gal x 60 min/hr)
[d] PM calculated based on total dissolved solids and solution drift (TDS x SD).
[e] PM_{10} assumed equal to 50% of PM. $PM_{2.5}$ assumed equal to PM_{10}.

Checked by: SKM
Reviewed by: RCM

TABLE 2-7
DESIGN AND EMISSIONS DATA FOR THE DIESEL FIRE PUMP ENGINE
WIREGRASS PLANT

Parameter	Fire Pump
Engine Model	to be determined
Performance	
Fuel	Diesel
Rating (HP)[a]	150
Maximum Operation (hours)	60
Number of Units	1
Stack Parameters	
Diameter (ft)	NA
Height (m)	NA
Temperature (°F)	NA
Velocity (ft/sec)	NA
Flow (acfm)	NA
Emissions	
SO_2 -Basis (lb/hp-hr) [b]	2.05E-03
(lb/hr)	1.2
(TPY)	0.036
NO_x (g/hp-hr)[c]	3.0
(lb/hr)	1.0
(TPY)	0.030
CO (g/hp-hr)[c]	3.7
(lb/hr)	1.22
(TPY)	0.037
VOC (lb/MMBtu) [b]	0.0025
(lb/hr)	0.38
(TPY)	0.011
PM/PM_{10} (g/hp-hr)[c]	0.22
(lb/hr)	0.07
(TPY)	0.002

NA - Not Available

a Based on manufacturer specifications.

b Based on Table 3.3-1, Diesel Industrial Engines, AP-42.

c Based on Tier 3 certification, US emissions standards for 2010 and after for nonroad diesel engines, NSPS, Subpart IIII. For NO_x, limit also includes non-methane hydrocarbons (NMHC).

Checked by: SKM
Reviewed by: RCM

Golder Associates

TABLE 2-8
SUMMARY OF MAXIMUM POTENTIAL ANNUAL EMISSIONS FOR THE WIREGRASS PLANT

Pollutant	Annual Emissions (tons/year)							Major Source Threshold (tons/year)	Major Source ?
	Biomass Boiler	Cooling Tower	Ash Silo Baghouse	Hog Tower Cyclone	Material Handling	Diesel Fire Pump	TOTAL		
PM	68.5	0.036	0.0015	37.5	28.8	0.002	135.0	250	No
PM_{10}	68.5	0.018	0.0015	37.5	6.6	0.002	112.7	250	No
$PM_{2.5}$	44.6	0.018	0.0015	37.5	4.2	0.002	86.3	250	No
SO2	246.8	NA	NA	NA	NA	0.036	246.8	250	No
NO_x	246.8	NA	NA	NA	NA	0.030	246.8	250	No
CO	246.8	NA	NA	NA	NA	0.037	246.8	250	No
VOC (as methane)	60.3	NA	NA	NA	NA	0.011	60.3	250	No
Lead	1.0	NA	NA	NA	NA	NA	1.0	250	No
Sulfuric Acid Mist	15.1	NA	NA	NA	NA	NA	15.1	250	No

Source: Golder, 2009.

Checked by: SKM
Reviewed by: Ren

TABLE 4-1
DETERMINATION OF ACCEPTABLE AMBIENT CONCENTRATION OF HAZARDOUS AIR POLLUTANTS
WIREGRASS PLANT

		Step 1: Toxicity Data [a]						Step 2: Adjustment of Toxicity Data		Step 3: Application of Safety Factor		Step 4: Determine AAC		
		Integrated Risk Information System (IRIS)												
Pollutant	CAS No.	Unit Risk (per µg/m³)	Cancer Risk	RBAC (µg/m³)	IRIS RfC (mg/m³)	OSHA PEL (mg/m³)	ACGIH TLV (mg/m³)	Basis of Toxicity	Adjustment (mg/m³)	Safety Factor	Safety Adjusted (mg/m³)	AAC (µg/m³)	Basis	Averaging Period
Acetaldehyde	75-07-0	2.20E-06	1/100,000	4.55E+00	9.00E-03	--	--	RBAC	None	None	None	4.55	RBAC	Annual
Acetophenone	98-86-2	--	--	--	--	--	49.04	ACGIH	11.6764	300	0.03892	38.9	ACGIH	24-Hour
Acrolein	107-02-8	--	--	--	2.00E-05	--	--	RfC	None	None	None	0.02	RfC	Annual
Antimony		--	--	--	--	0.5	--	OSHA PEL	0.1190	300	0.00040	0.4	OSHA PEL	24-Hour
Arsenic		0.0043	1/1,000,000	2.33E-04	--	--	--	RBAC	None	None	None	2.33E-04	RBAC	Annual
Benzene	71-43-2	7.80E-06	1/1,000,000	1.28E-01	3.00E-02	--	--	RBAC	None	None	None	0.13	RBAC	Annual
Beryllium		2.40E-03	1/100,000	4.17E-03	2.00E-02	--	--	RBAC	None	None	None	0.0042	RBAC	Annual
Bis(2-ethylhexyl)phthalate	117-81-7	--	--	--	--	5	--	OSHA PEL	1.1905	300	0.00397	4.0	OSHA PEL	24-Hour
Cadmium		1.80E-03	1/100,000	5.56E-03	--	--	--	RBAC	None	None	None	0.0056	RBAC	Annual
Carbon Tetrachloride	56-23-5	1.50E-05	1/100,000	6.67E-01	--	--	--	RBAC	None	None	None	0.67	RBAC	Annual
Chlorine	7782-50-5	--	--	--	--	3	--	OSHA PEL	0.7143	10	0.07143	71.4	OSHA PEL	15-Minute
Chlorobenzene	108-90-7	--	--	--	--	350	--	OSHA PEL	83.3333	300	0.27778	277.8	OSHA PEL	24-Hour
Chloroform	67-66-3	2.30E-05	1/100,000	4.35E-01	--	--	--	RBAC	None	None	None	0.43	RBAC	Annual
Chromium		--	--	--	--	1	--	OSHA PEL	0.2381	300	0.00079	0.8	OSHA PEL	24-Hour
Chromium+6		1.20E-02	1/1,000,000	8.33E-05	8.00E-06	--	--	RBAC	None	None	None	8.33E-05	RBAC	Annual
Cobalt		--	--	--	--	0.1	--	OSHA PEL	0.0238	300	0.00008	0.1	OSHA PEL	24-Hour
1,2 - Dichloroethane (ethylene dichloride)	107-06-2	2.60E-05	1/100,000	3.85E-01		--	--	RBAC	None	None	None	0.38	RBAC	Annual
Ethylbenzene	100-41-4	--	--	--	1.00E+00	--	--	RfC	None	None	None	1000	RfC	Annual
Formaldehyde	50-00-0	1.30E-05	1/100,000	7.69E-01		--	--	RBAC	None	None	None	0.77	RBAC	Annual
n-Hexane		--	--	--	7.00E-01	--	--	RfC	None	None	None	700	RfC	Annual
Hydrogen Chloride	7647-01-0	--	--	--	2.00E-02	--	--	RfC	None	None	None	20	RfC	Annual
Hydrogen Fluoride	7664-39-3	--	--	--	--	2.33	--	OSHA PEL	0.5539	300	0.00185	1.85	OSHA PEL	24-Hour
Lead-Total		--	--	--	--	--	0.50	ACGIH	0.1190	300	3.97E-04	0.4	ACGIH	24-Hour
Manganese		--	--	--	5.00E-05	--	--	RfC	None	None	None	0.05	RfC	Annual
Mercury		--	--	--	3.00E-04	--	--	RfC	None	None	None	0.30	RfC	Annual
Methyl Bromide (bromomethane)	74-83-9	--	--	--	5.00E-03	--	--	RfC	None	None	None	5	RfC	Annual
Methyl Chloride (chloromethane)	74-87-3	--	--	--	9.00E-02	--	--	RfC	None	None	None	90	RfC	Annual
Methyl Ethyl Ketone	78-93-3	--	--	--	5.00E+00	--	--	RfC	None	None	None	5000	RfC	Annual
Methylene Chloride (dichloromethane)	75-09-2	4.70E-07	1/100,000	2.13E+01	--	--	--	RBAC	None	None	None	21.3	RBAC	Annual
Nickel [b]		2.40E-04	1/1,000,000	4.17E-03	--	--	--	RBAC	None	None	None	4.17E-03	RBAC	Annual
Pentachlorophenol [c]	87-86-5	3E-09	1/100,000	3.33E+03		--	--	RBAC	None	None	None	3333	RBAC	Annual
Perchloroethylene (tetrachloroethylene)	127-18-4	--	--	--	--	678.2	--	OSHA PEL	161.4860	300	0.53829	538.3	OSHA PEL	24-Hour
Phenols	108-95-2	--	--	--	--	19	--	OSHA PEL	4.5238	300	0.01508	15.1	OSHA PEL	24-Hour
Phosphorus	7723-14-0	--	--	--	--	0.1	--	OSHA PEL	0.0238	300	0.00008	0.1	OSHA PEL	24-Hour
Propylene dichloride (1,2 dichloropropane)	78-87-5	--	--	--	4.00E-03	--	--	RfC	None	None	None	4	RfC	Annual
Propionaldehyde	123-38-6	--	--	--	8.00E-03	--	--	RfC	None	None	None	8	RfC	Annual
Selenium		--	--	--	--	0.2	--	OSHA PEL	0.0476	300	0.00016	0.2	OSHA PEL	24-Hour
Styrene	100-42-5	--	--	--	1.00E+00	--	--	RfC	None	None	None	1000	RfC	Annual
Toluene	108-88-3	--	--	--	5.00E+00	--	--	RfC	None	None	None	5000	RfC	Annual
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	--	--	--	5.00E+00	--	--	RfC	None	None	None	5000	RfC	Annual
		--	--	--	6.00E+00	--	--	RfC	None	None	None	6000	RfC	24-Hour
		--	--	--	7.00E+00	--	--	RfC	None	None	None	7000	RfC	8-Hour
		--	--	--	7.00E+00	--	--	RfC	None	None	None	7000	RfC	4-Hour
		--	--	--	9.00E+00	--	--	RfC	None	None	None	9000	RfC	1-Hour
Trichloroethylene	79-01-6	--	--	--	--	537.3	--	OSHA PEL	127.9248	300	0.42642	426.4	OSHA PEL	24-Hour
2,4,6 - Trichlorophenol	88-06-2	3.10E-06	1/100,000	3.23E+00	--	--	--	RBAC	None	None	None	3.2	RBAC	Annual
o-Xylene	95-47-6	--	--	--	--	435.0	--	OSHA PEL	103.5714	300	0.34524	345.2	OSHA PEL	24-Hour
Vinyl Chloride	75-01-4	4.40E-06	1/1,000,000	2.27E-01	--	--	--	RBAC	None	None	None	0.23	RBAC	Annual
Polycyclic Organic Matters (POMs)														
Acenaphthene	83-32-9	--	--	--	--	--	--							
Acenaphthylene	208-96-8	--	--	--	--	--	--							
Anthracene	120-12-7	--	--	--	--	--	--							
Benzo(a)pyrene [c]	50-32-8	0.00000021	1/100,000	4.76E+01	--	--	--	RBAC	None	None	None	48	RBAC	Annual
Benzo(g,h,i)perylene	191-24-2	--	--	--	--	--	--							
Benzo(a)anthracene	56-55-3	--	--	--	--	--	--							
Benzo(b)fluoranthene	205-99-2	--	--	--	--	--	--							
Benzo(k)fluoranthene	207-08-9	--	--	--	--	--	--							
Chrysene	218-01-9	--	--	--	--	--	--							
Dibenzo(a,h)anthracene	53-70-3	--	--	--	--	--	--							
Fluoranthene	206-44-0	--	--	--	--	--	--							
Fluorene	86-73-7	--	--	--	--	--	--							
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	--	--	--							
3 - Methylchloranthrene	56-49-5	--	--	--	--	--	--							
2 - Methylnapthalene	91-57-6	--	--	--	--	--	--							
Naphthalene	91-20-3	--	--	--	3.00E-03	--	--	RfC	None	None	None	3	RfC	Annual
Phenanthrene	85-01-8	--	--	--	--	--	--							
Pyrene	129-00-0	--	--	--	--	--	--							
Total POMs [d]												3	RfC	Annual

PEL = Permissible Exposure Limit, RBAC = Risk Based Air Concentration, RfC = Inhalation Reference Concentration, REL = Recommended Exposure Limit, AAC = Acceptable Ambient Concentration, TLV = Threshold Limiting Value.

[a] Toxicity data obtained from EPA's Integrated Risk Information System (IRIS) database, or the Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limit (PEL) standards, or the American Conference of Governmental and Industrial Hygienist's (ACGIH) Threshold Limiting Values (TLV) per the instructions of the Georgia Department of Natural Resources' Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (revised June 21, 1998).

[b] Nickel refinery dust from IRIS.

[c] Used drinking water integrated risk information.

[d] AAC is set equal to the AAC of naphthalene, worst-case AAC of the available AACs within the POM group.

Checked by:
Reviewed by:

TABLE 4-2
AIR TOXICS ANALYSIS
WIREGRASS PLANT

Pollutant	CAS No.	Emission Rate [1] Hourly (lb/hr)	Emission Rate [1] Annual (TPY)	AAC [2] (µg/m3)	AAC [2] Averaging Time	Project Impact [3]	Exceed AAC?
Acetaldehyde	75-07-0	5.4E-02	2.3E-01	4.5	Annual	2.6E-04	No
Acetophenone	98-86-2	9.0E-07	3.9E-06	38.9	24-Hour	4.1E-08	No
Acrolein	107-02-8	2.2E-02	9.6E-02	2.0E-02	Annual	1.1E-04	No
Antimony		4.9E-05	2.2E-04	0.4	24-Hour	2.3E-06	No
Arsenic		1.7E-03	7.5E-03	2.3E-04	Annual	8.3E-06	No
Benzene	71-43-2	9.3E-02	4.1E-01	0.1	Annual	4.5E-04	No
Beryllium		1.4E-08	3.6E-09	4.2E-03	Annual	4.0E-12	No
Bis(2-ethylhexyl)phthalate	117-81-7	1.3E-05	5.8E-05	4.0	24-Hour	6.1E-07	No
Cadmium		2.2E-06	9.6E-06	5.6E-03	Annual	1.1E-08	No
Carbon Tetrachloride	56-23-5	1.3E-02	5.6E-02	0.7	Annual	6.2E-05	No
Chlorine	7782-50-5	2.2E-01	9.7E-01	71.4	15-Minute	7.3E-02	No
Chlorobenzene	108-90-7	9.3E-03	4.1E-02	277.8	24-Hour	4.3E-04	No
Chloroform	67-66-3	7.9E-03	3.5E-02	0.4	Annual	3.8E-05	No
Chromium		3.1E-03	1.4E-02	0.8	24-Hour	1.4E-04	No
Chromium+6		2.2E-05	9.6E-05	8.3E-05	Annual	1.1E-07	No
Cobalt		4.1E-05	1.8E-04	0.1	24-Hour	1.9E-06	No
1,2 - Dichloroethane (ethylene dichloride)	107-06-2	8.2E-03	3.6E-02	0.4	Annual	4.0E-05	No
Ethylbenzene	100-41-4	8.7E-03	3.8E-02	1,000	Annual	4.2E-05	No
Formaldehyde	50-00-0	1.3E-01	5.8E-01	0.8	Annual	6.5E-04	No
n-Hexane		9.7E-02	2.4E-02	700	Annual	2.7E-05	No
Hydrogen Chloride	7647-01-0	1.9E+00	8.2E+00	20	Annual	9.1E-03	No
Hydrogen Fluoride	7664-39-3	4.4E-01	1.9E+00	1.8	24-Hour	2.0E-02	No
Lead-Total		2.4E-03	1.0E-02	0.4	24-Hour	1.1E-04	No
Manganese		4.6E-07	1.1E-07	0.1	Annual	1.3E-10	No
Mercury		3.1E-07	6.8E-07	0.3	Annual	7.5E-10	No
Methyl Bromide (bromomethane)	74-83-9	4.2E-03	1.9E-02	5.0	Annual	2.1E-05	No
Methyl Chloride (chloromethane)	74-87-3	6.5E-03	2.8E-02	90.0	Annual	3.1E-05	No
Methyl Ethyl Ketone	78-93-3	1.5E-03	6.7E-03	5,000	Annual	7.4E-06	No
Methylene Chloride (dichloromethane)	75-09-2	8.2E-02	3.6E-01	21.3	Annual	4.0E-04	No
Nickel		1.4E-03	6.0E-03	4.2E-03	Annual	6.6E-06	No
Pentachlorophenol	87-86-5	1.4E-05	6.3E-05	3,333.3	Annual	7.0E-08	No
Perchloroethylene (tetrachloroethylene)	127-18-4	1.5E-02	6.4E-02	538.3	24-Hour	6.7E-04	No
Phenols	108-95-2	1.4E-02	6.3E-02	15.1	24-Hour	6.6E-04	No
Phosphorus	7723-14-0	1.7E-04	7.4E-04	0.1	24-Hour	7.7E-06	No
Propylene dichloride (1,2 dichloropropane)	78-87-5	9.3E-03	4.1E-02	4.0	Annual	4.5E-05	No
Propionaldehyde	123-38-6	1.7E-02	7.5E-02	8.0	Annual	8.3E-05	No
Selenium		2.9E-08	7.2E-09	0.2	24-Hour	1.3E-09	No
Styrene	100-42-5	2.9E-02	1.3E-01	1,000	Annual	1.4E-04	No
Toluene	108-88-3	1.8E-04	4.6E-05	5,000	Annual	5.1E-08	No
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	8.7E-03	3.8E-02	5,000	Annual	4.2E-05	No
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	8.7E-03	3.8E-02	6,000	24-Hour	4.0E-04	No
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	8.7E-03	3.8E-02	7,000	8-Hour	8.6E-04	No
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	8.7E-03	3.8E-02	7,000	4-Hour	1.6E-03	No
1, 1, 1 -Trichlorethane (methyl chloroform)	71-55-6	8.7E-03	3.8E-02	9,000	1-Hour	2.2E-03	No
Trichloroethylene	79-01-6	8.5E-03	3.7E-02	426.4	24-Hour	3.9E-04	No
2,4,6 - Trichlorophenol	88-06-2	6.2E-06	2.7E-05	3.2	Annual	3.0E-08	No
o-Xylene	95-47-6	7.0E-03	3.1E-02	345.2	24-Hour	3.2E-04	No
Vinyl Chloride	75-01-4	5.1E-03	2.2E-02	0.2	Annual	2.5E-05	No
Naphthalene	91-20-3	2.7E-02	1.2E-01	3.0	Annual	1.3E-04	No
Total POMs		3.5E-02	1.5E-01	3.0	Annual	1.7E-04	No

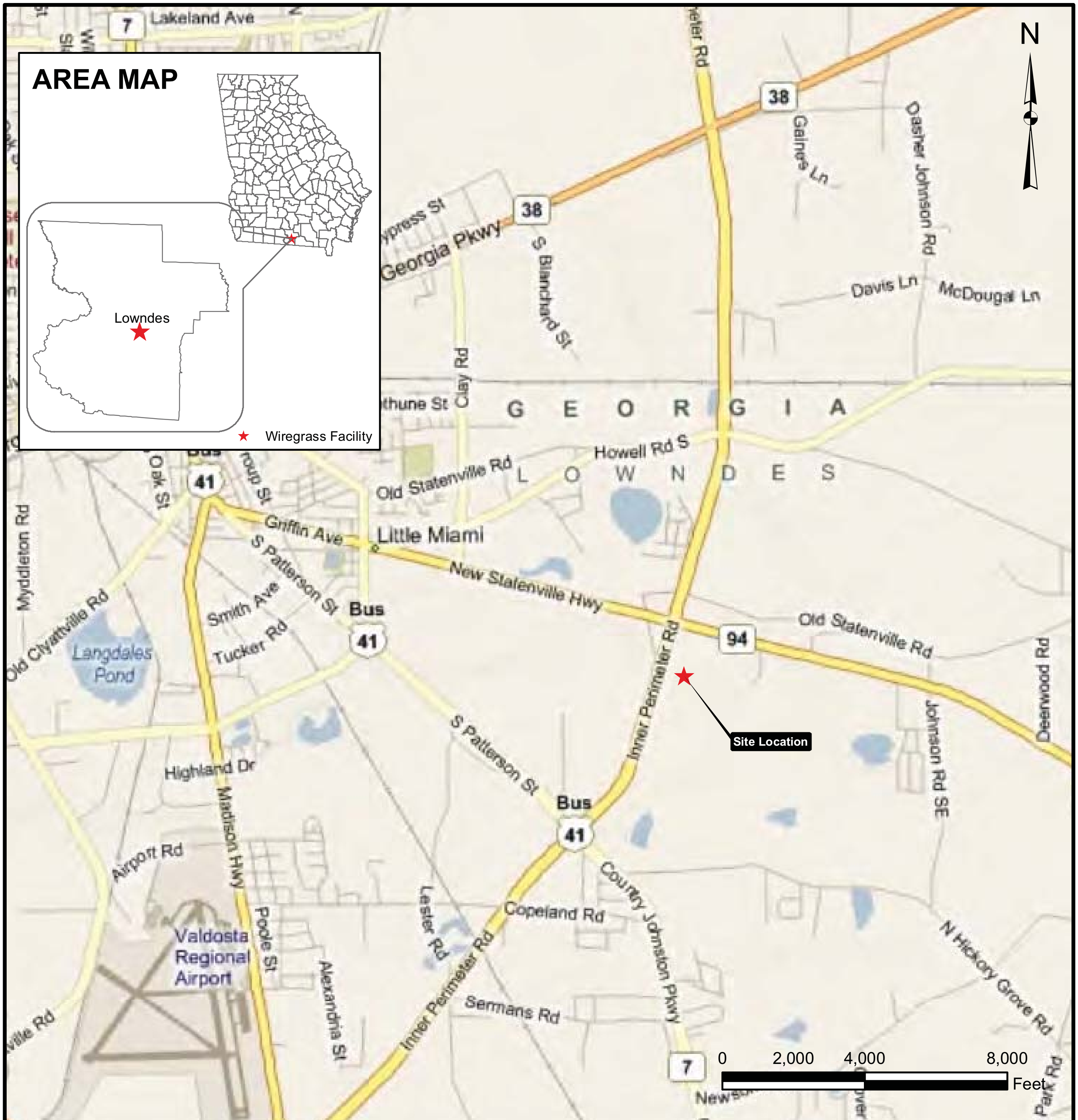
1. See Table 2-3 for emission rates.
2. See Table 4-1 for AAC and averaging times.
3. Based on modeling impacts using generic 1 g/s (7.937 lb/hr)emission rate.

Modeled Impact, Annual Average (µg/m^3) =	0.039
Modeled Impact, 24-Hour Average (µg/m^3) =	0.363
Modeled Impact, 8-Hour Average (µg/m^3) =	0.785
Modeled Impact, 4-Hour Average (µg/m^3) =	1.489
Modeled Impact, 1-Hour Average (µg/m^3) =	1.965
Modeled Impact, 15-Minute Average (µg/m^3) =	2.593

The 15-minute and 4-hour average impacts were obtained from the 1-hour average modeled impacts by multiplying factors of 1.32 and 0.76, respectively based on the ratio of specific averaging period to 1-hour raised to 0.2 power.

Checked by: GKM
Reviewed by: [signature]

FIGURES



LEGEND

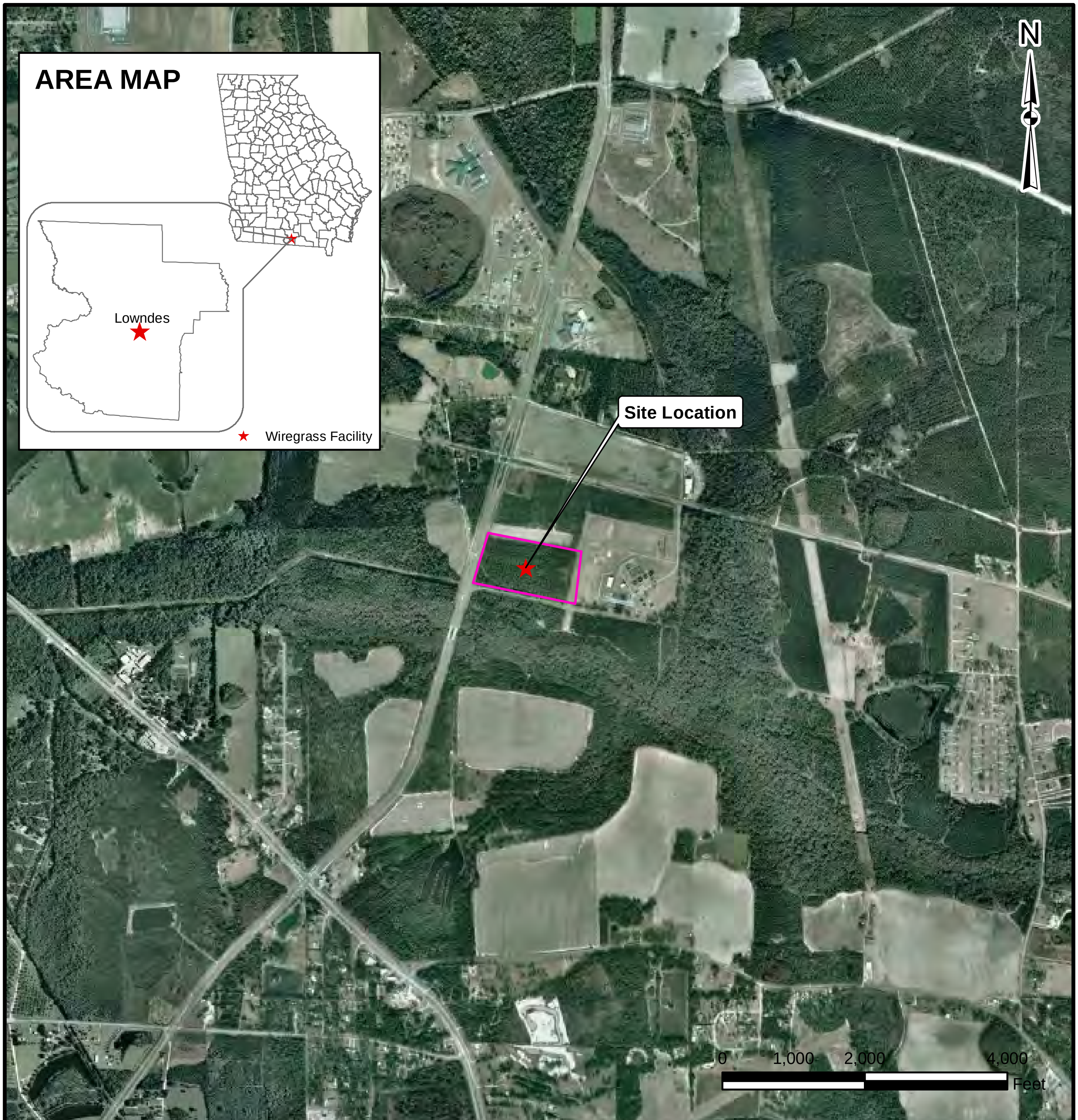
★ Wiregrass Facility

REFERENCES

1. Site Location, Sterling Planet, 2009.

Golder Associates, Gainesville, Florida	SCALE: AS SHOWN	GENERAL FACILITY LOCATION
	DATE: 8/1/2008	
	DESIGN: SAM	
	GIS: NRL	
FILE No. 09390124A001	CHECK: SKM	WIREGRASS POWER, LLC, WIREGRASS PLANT
PROJECT No. 093-90124 REV. 0	REVIEW: RCM	FIGURE 2-1

Map Document: 09390124A001_GenFacLoc.mxd / Modified 12/10/2009 11:49:13 AM / Plotted 12/10/2009 11:54:03 AM by rlamar



LEGEND

★ Wiregrass Facility

▭ Project Boundary (Approximate Location)

REFERENCES

1. Project Boundary, Site Location, Sterling Planet, 2009.

Golder Associates
Gainesville, Florida

FILE No.	09390124A002		
PROJECT No.	093-90124	REV.	0

SCALE	AS SHOWN
DATE	8/1/2008
DESIGN	SAM
GIS	NRL
CHECK	SKM
REVIEW	RCM

PROPERTY MAP OF WIREGRASS PLANT

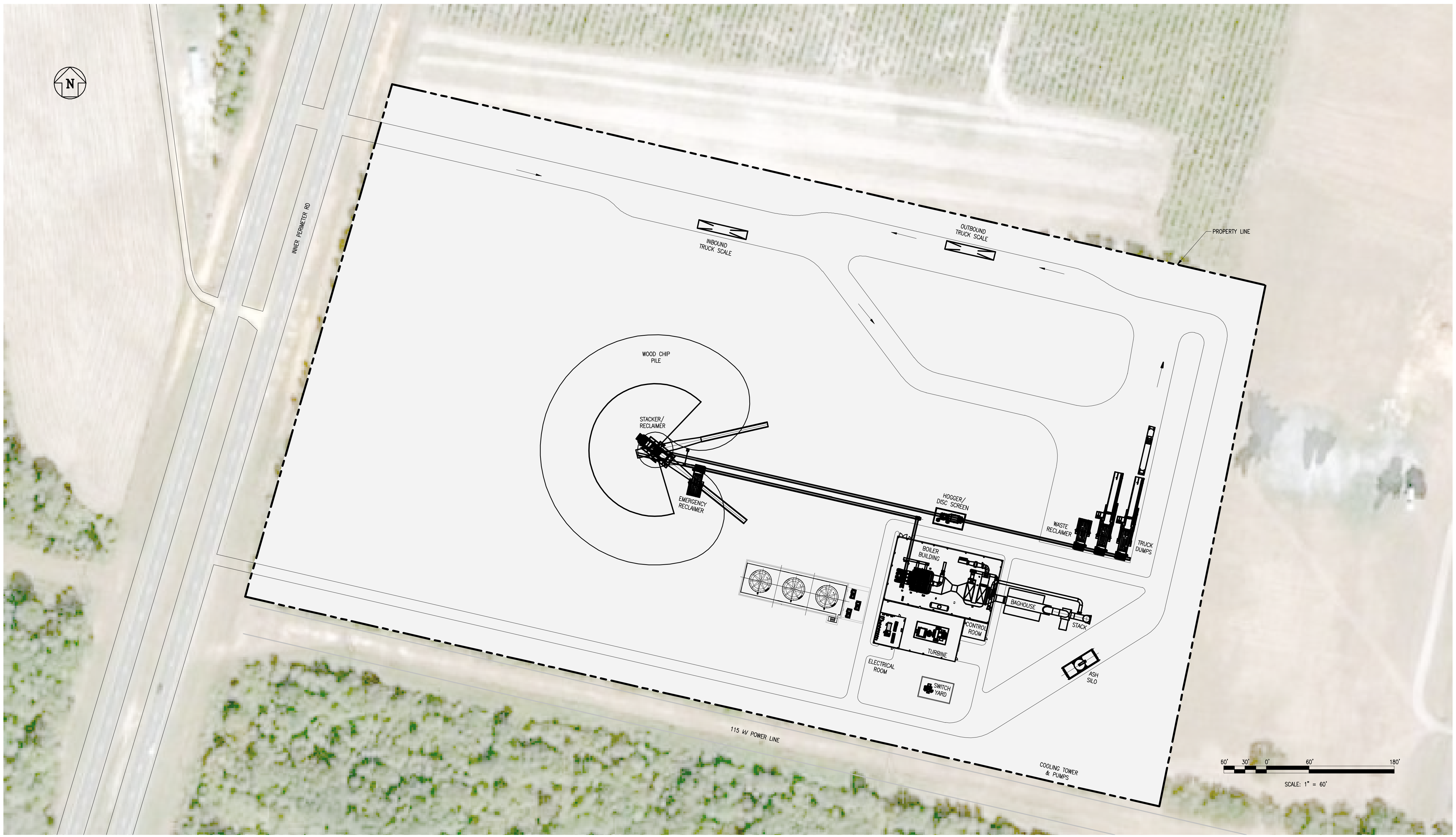
WIREGRASS POWER, LLC, WIREGRASS PLANT

FIGURE **2-2**

Map Document: 09390124A002_PropMap.mxd / Modified 12/10/2009 11:53:20 AM / Plotted 12/11/2009 9:48:00 AM by rlamar

** SAFETY FIRST **

Plotted by White, Jeff on Friday, October 30, 2009 10:37:47 AM



REV	DRAWN	DATE	CHK'D	DATE	DESCRIPTION
A	LDW	09/29/09			

REFERENCE DRAWINGS

Drawing File Name
709001G01.dwg

NOT FOR CONSTRUCTION

STEAM & POWER ESI
ESI Inc. of Tennessee
1250 Roberts Blvd.
Kennesaw, GA 30144
(770)427-6200
esitenn.com

SITE PLAN

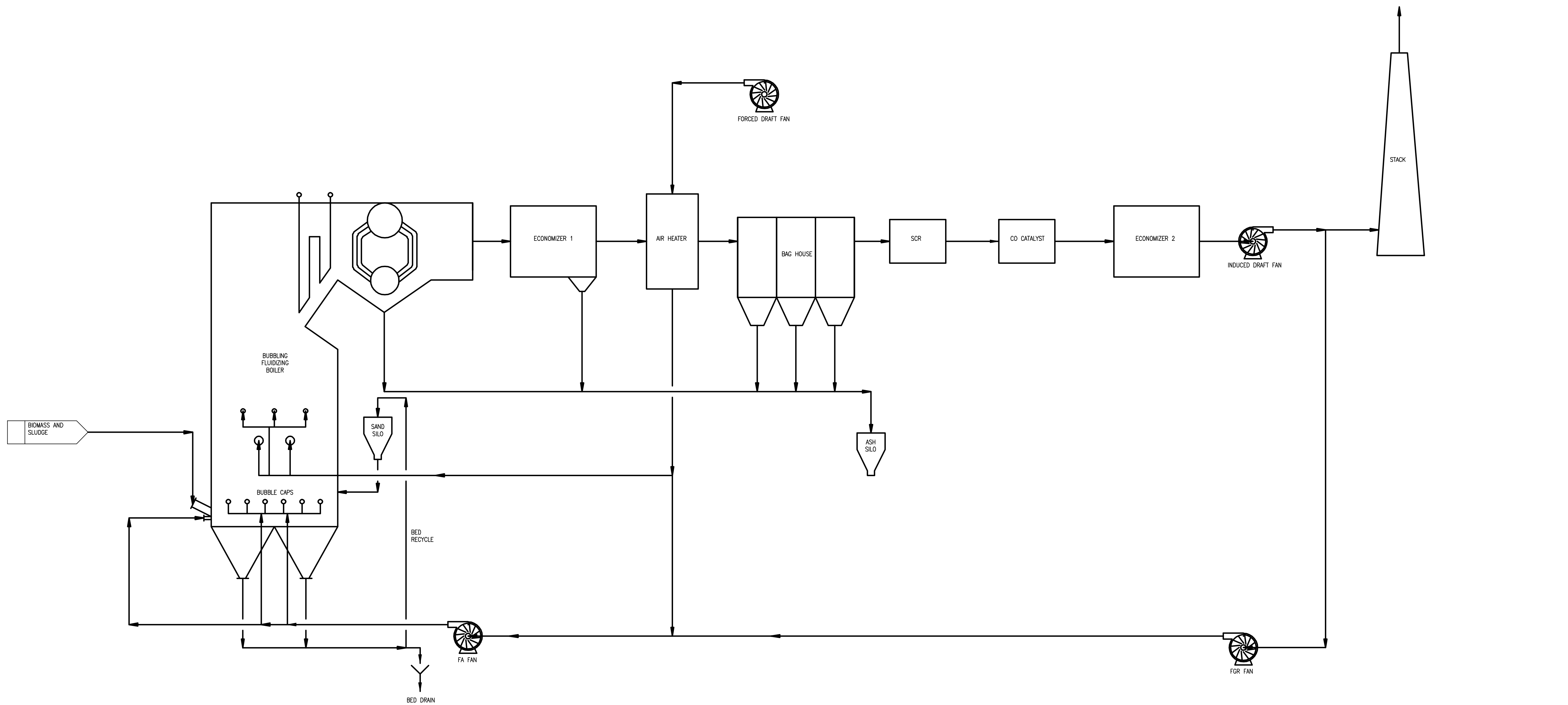
WIREGRASS POWER, LLC
WIREGRASS FACILITY VALDOSTA, GA

SCALE: 1" = 60'
DRAWING NO.: 709001 G01
REV: A

DRAWING SCALE BASED ON A REPRODUCTION SIZE OF 24"x36"

Figure 2-3
Facility Plot Plan

** SAFETY FIRST **



REV	DRAWN	DATE	CHK'D	DATE	DESCRIPTION
A	LDW	09/29/09			

REFERENCE DRAWINGS

Drawing File Name
709001F01.dwg

NOT FOR CONSTRUCTION

ESI Inc. of Tennessee
1250 Roberts Blvd.
Kennesaw, GA 30144
(770)427-6200
esitenn.com

BIOMASS PLANT
AIR AND FLUE GAS FLOW

WIREGRASS POWER, LLC

WIREGRASS FACILITY
VALDOSTA, GA

SCALE: None

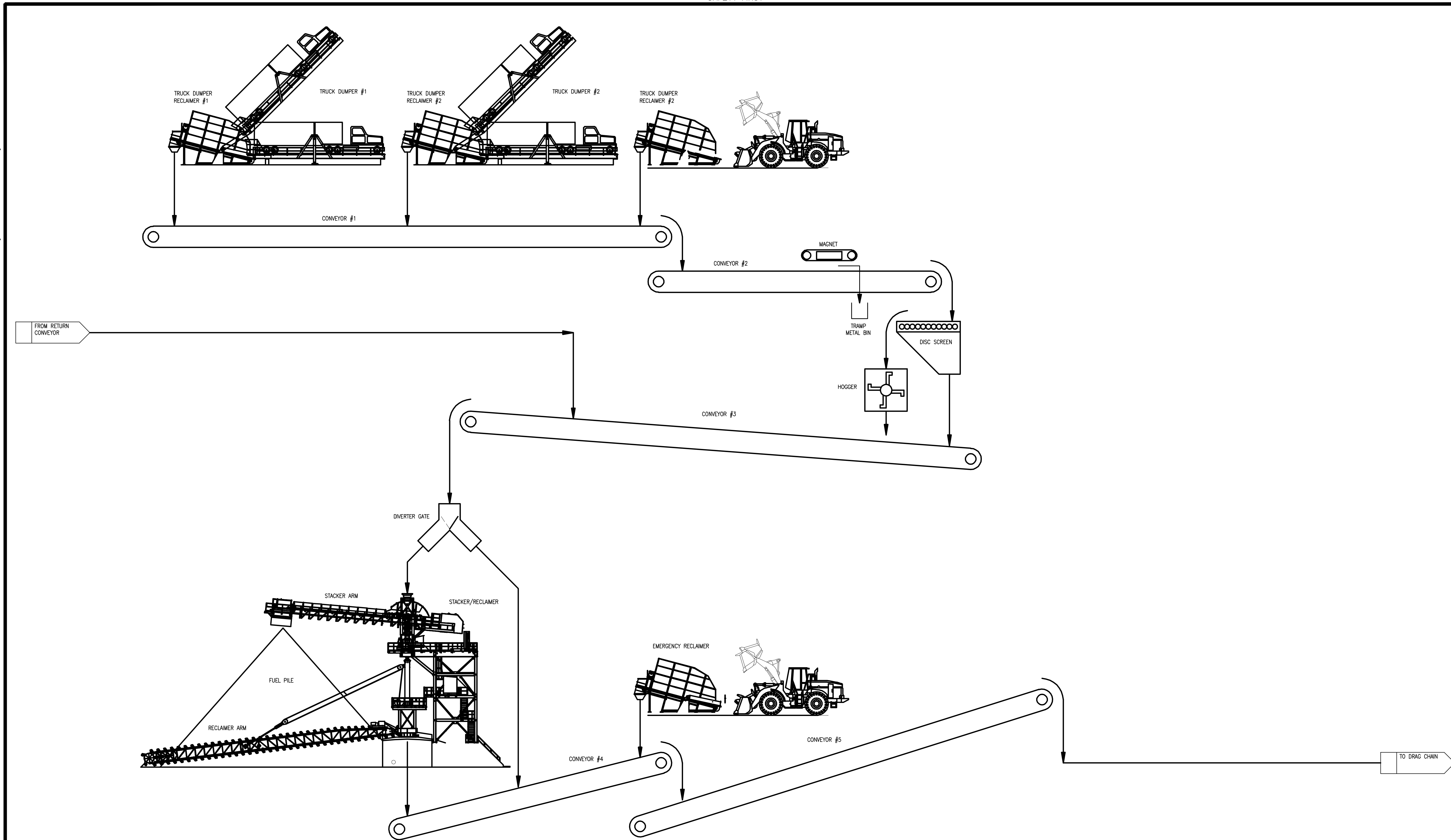
DRAWING NO.: 709001 F01

REV: A

DRAWING SCALE BASED ON A REPRODUCTION SIZE OF 24"x36"

Figure 2-4
Power Island Process Flow Diagram

** SAFETY FIRST **



REV	DRAWN	DATE	CHK'D	DATE	DESCRIPTION
A	LDW	10/14/09			

REFERENCE DRAWINGS

Drawing File Name: 709001F03.dwg

NOT FOR CONSTRUCTION

STEAM & POWER ESI
ESI Inc. of Tennessee
1250 Roberts Blvd.
Kennesaw, GA 30144
(770)427-6200
esitenn.com

FUEL HANDLING FLOW SHEET
SHEET 1 OF 2

WIREGRASS POWER, LLC
WIREGRASS FACILITY VALDOSTA, GA

SCALE: None
DRAWING NO.: 709001 F03
REV: A

DRAWING SCALE BASED ON A REPRODUCTION SIZE OF 24"x36"

Figure 2-5a
Biomass Handling Process Flow Diagram

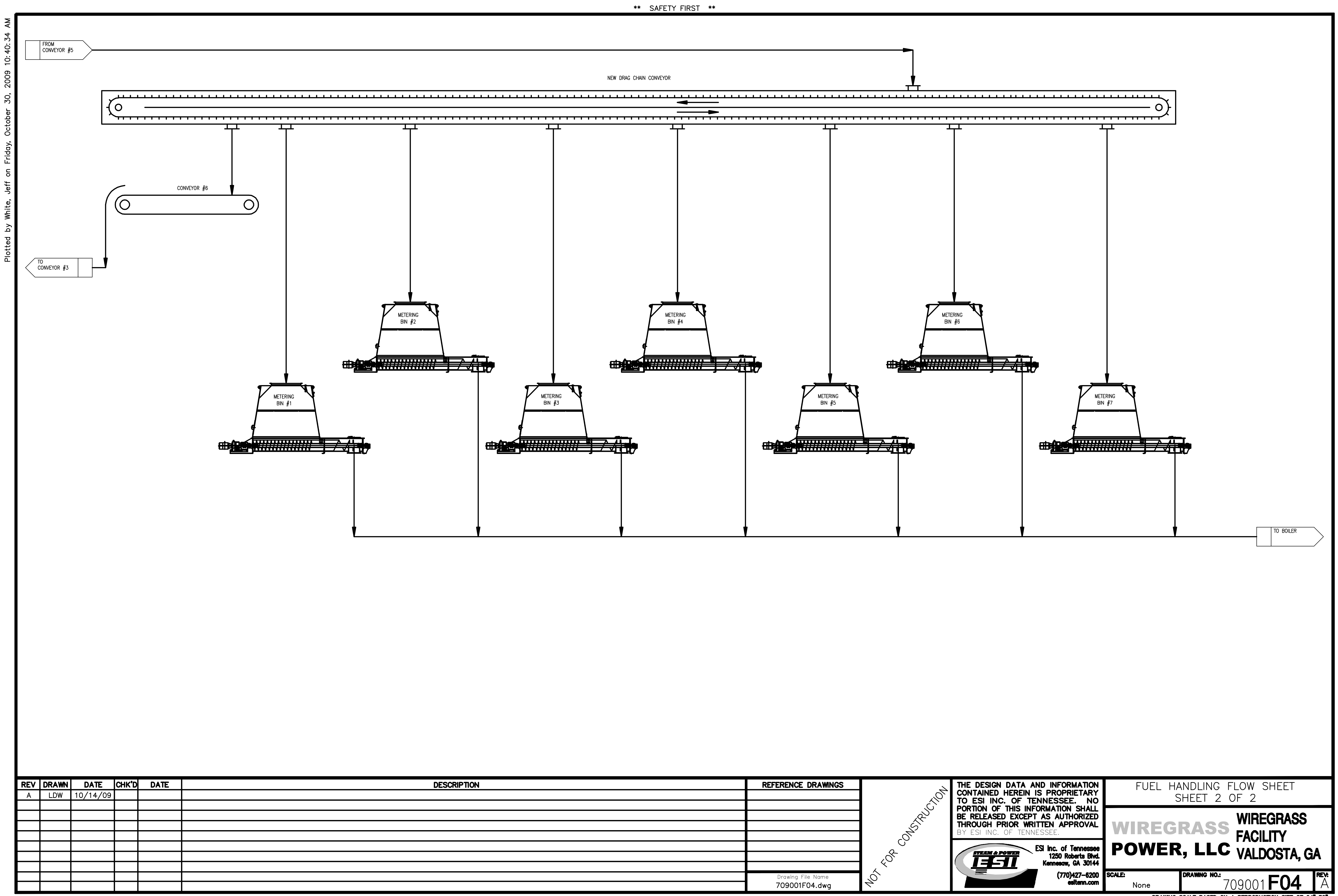


Figure 2-5b
Biomass Handling Process Flow Diagram

APPENDIX A

BIOMASS FUEL ANALYSIS

Sterling Planet - Wiregrass
Emission Calculations

Boiler Description	**Field Erected Bubbling Fluid Bed**			
Operating Conditions (psig)	**1500**			
Operating Conditions (°F)	**950**			
Boiler Steam Flow	**kpph**	402.6		
Boiler Efficiency	**%**	70.0		
			Operating Hours (hr/yr)	8,760
Heat Input	**mmbtu/hr**	626.0		

Fuel Type (primary) — **Biomass**
Fuel Type (secondary) — **Waste - less than 0.5% by heat input, see the attached analysis**
Fuel Analysis (tertiary) — **Natural gas - start-up only**

	As Received	**TSM**	**ug/g**
% Moisture	50.00	Arsenic, As	1.1800
% Ash	1.00	Berylium, Be	0.0000
% Carbon	25.00	Cadmium, Cd	0.0015
%Hydrogen	3.00	Chromium, Cr	2.1400
% Nitrogen	0.15	Lead, Pb	1.6200
% Sulfur	0.05	Nickel, Ni	0.9400
% Oxygen	20.79	Selenium, Se	0.0000
% Chloride	0.010	Manganese, Mn	0.0000
		Total TSM	
Btu/lb.	4,300		
		Mercury, Hg	0.0001

Control Technology	Sorbent	SCR	Baghouse	Baghouse	Baghouse	CO Catalyst

Stack Data

Stack flow (pph)	685,999
Stack flow (acfm)	240,282
Stack exhaust gas temperature (°F)	325
Stack height (ft)	150
Stack diameter (ft)	9.2

Flue Gas Analysis	**% by Volume**
CO_2	11.87
SO_2	0.01
O_2	3.11
N_2	58.58
H_2O	26.43
CO	0.00

Load Point Data	**100%**	**75%**	**50%**	**25%**
Steam flow (kpph)	403	302	201	101
Heat input (mmbtu/hr)	626	477	318	159
Air flow rate (pph)	545,537	409,153	272,769	136,384
Air flow rate (acfm)	124,953	93,715	62,477	31,238
Flue gas flow rate (pph)	685,999	514,499	343,000	171,500
Flue gas flow rate (acfm)	240,282	180,212	120,141	60,071
Fuel flow rate (pph)	141,729	106,297	70,865	35,432

ATTACHMENT B

ACID RAIN FORMS

TABLE B-1
ESTIMATION OF PM EMISSION FACTORS AND RATES FOR WIND EROSION FROM ACTIVE STORAGE PILES
WIREGRASS PLANT

Parameters		Wind Erosion at Wood Chip Pile
Emission Point/Area		WE 1
Daily activity hours		16
Annual activity days		365
Storage Pile Data		
Material Type		Biomass
Pile Description (shape)		Conical
Pile Radius (ft) [a]		93
No. Piles		1
Pile Base Area (ft^2)		27,172
Pile Height (ft)		20
Pile Surface Area (ft^2)(2/3rd of cone surface)		18,529
Pile Surface Area (acre)		0.425
General/ Site Characteristics		
Days of precipitation greater than or equal to 0,25 mm (p) [b]	Daily	0
	Annual	106
Time (%) that unobstructed wind speed exceeds 5,4 m/s at mean pile height [b] (f)	Daily	33.3
	Annual	9.4
Silt content (s) [c] (%)		3.0
Particle size multiplier (k), PM		1.00
Particle size multiplier (k), PM_{10}		0.50
Particle size multiplier (k), $PM_{2.5}$		0.25
Emission Control Data		
Emission control method		Water spray
Emission control removal efficiency, %		75
Emission Factor (EF) Equation		
Uncontrolled EF (UEF) Equation	UEF (lb/day/acre) = k x 1.7 x (s/1.5) x ((365 - p)/235) x (f/15)	
Controlled (Final) EF (CEF) Equation	CEF (lb/day/acre) = UEF (lb/day/acre) x (100 - Removal efficiency (%))	
Calculated PM Emission Factor (EF)		
Uncontrolled EF, lb/day/acre	Short term	11.72
	Annual	2.35
Controlled EF, lb/day/acre	Short term	2.93
	Annual	0.59
Calculated PM_{10} Emission Factor (EF)		
Uncontrolled EF, lb/day/acre	Short term	5.86
	Annual	1.17
Controlled EF, lb/day/acre	Short term	1.47
	Annual	0.29
Calculated $PM_{2.5}$ Emission Factor (EF)		
Uncontrolled EF, lb/day/acre	Short term	2.93
	Annual	0.59
Controlled EF, lb/day/acre	Short term	0.73
	Annual	0.15
Estimated Emission Rate (ER)		
PM ER tons/yr (TPY)		0.046
PM_{10} ER tons/yr (TPY)		0.023
$PM_{2.5}$ ER tons/yr (TPY)		0.011

Source: USEPA, 1992 (Fugitive Dust Background and Technical Information Document for Best Available Control Measures, Section 2.3.1.3.3, Wind Emissions from Continuously Active Piles)

Checked by: SKM
Reviewed by: KCJ

[a] Pile radius estimated from facility plot plan.
[b] Based on hourly surface meteorological data from Tallahassee, 2005.
[c] ESI, 2009.

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TABLE B-2
ESTIMATION OF PM EMISSION FACTORS AND RATES FOR BULLDOZING OPERATIONS
WIREGRASS PLANT

Parameters		Bulldozing at Storage Pile	Bulldozing at Truck Dumps
Emission Point / Area		BD 1	BD 2
Operational Data			
Daily activity hours	Daily	16	16
Annual activity days	Annual	365	365
Material Handling Data			
Moisture content (M) [a] (%)		50.0	50.0
General/ Site Characteristics			
Silt content (s) [b] (%)		3	3
Emission Control Data			
Emission control method		None	None
Emission control removal efficiency (%)		0	0
PM_{15} & PM_{10} Emission Factors (EF) Equations			
Uncontrolled PM_{30} EF (UEF) Equation [c]	UEF (lb/hr) = 78.4 x $(s)^{1.2}$/ $(M)^{1.3}$		
Controlled PM_{30} EF (CEF) Equation	CEF (kg/hr) = UEF (lb/Mg) x [100 - Removal efficiency (%)]		
Uncontrolled PM_{15} EF (UEF) Equation [c]	UEF (lb/hr) = 18.6 x $(s)^{1.5}$/ $(M)^{1.4}$		
Controlled PM_{15} EF (CEF) Equation	CEF (kg/hr) = UEF (lb/Mg) x [100 - Removal efficiency (%)]		
Uncontrolled PM_{10} EF (UEF) Equation	UEF (lb/hr) = 0.75 x UEF of PM_{15}		
Controlled PM_{10} EF (CEF) Equation	CEF (lb/hr) = 0.75 x CEF of PM_{15}		
Uncontrolled $PM_{2.5}$ EF (UEF) Equation	UEF (lb/hr) = 0.105 x UEF of PM_{30}		
Controlled $PM_{2.5}$ EF (CEF) Equation	CEF (lb/hr) = 0.105 x CEF of PM_{30}		
Calculated PM_{15} & PM_{10} Emission Factors (EF)			
Uncontrolled PM_{30} EF, lb/hr	Short term, annual	1.8122	1.8122
Controlled PM_{30} EF, lb/hr	Short term, annual	1.8122	1.8122
Uncontrolled PM_{15} EF, lb/hr	Short term, annual	0.4042	0.4042
Controlled PM_{15} EF, lb/hr	Short term, annual	0.4042	0.4042
Uncontrolled PM_{10} EF, lb/hr	Short term, annual	0.3032	0.3032
Controlled PM_{10} EF, lb/hr	Short term, annual	0.3032	0.3032
Uncontrolled $PM_{2.5}$ EF, lb/hr	Short term, annual	0.1903	0.1903
Controlled $PM_{2.5}$ EF, lb/hr	Short term, annual	0.1903	0.1903
Estimated Emission Rate (ER)			
PM_{30} ER TPY		5.29	5.29
PM_{10} ER TPY		0.89	0.89
$PM_{2.5}$ ER TPY		0.56	0.56

Source: USEPA, 1998 (AP-42, Section 11.9 for Western Surface Coal Mines).
[a] Moisture content from fuel analysis provided by ESI, Inc.
[b] Silt content value provided by ESI, Inc.
[c] Based on bulldozing for overburden

Checked by: SKM
Reviewed by: [signature]

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TABLE B-3
ESTIMATION OF PM EMISSION FACTORS AND RATES FOR TRUCK TRAFFIC ON PAVED ROADS
WIREGRASS PLANT

Parameters		**Woodchip Trucks**
Vehicle Data		
Vehicle Type		Truck
Vehicle capacity and load (tons)	Capacity	22
	Unloaded	15.0
	Loaded	37.0
	Average	26.0
Operating time, hours	Daily	16
Operating time, days	Annual	365
Vehicle kilometers traveled (VKT)		
Number of vehicles	Daily	80
	Annual	29,200
Distance traveled (mile) /vehicle [d]	One-way trip	0.26
	Round trip	0.52
VMT (no. vehicles x mile traveled per trip)	Daily, round trip	42
	Annual, round trip	15,184
General/ Site Characteristics		
Days of precipitation greater than or	No. of Hours/Day	0
equal to 0.254 mm (p) [a]	No. of Days/Year	106
Silt loading (sL) (g/m^2) [b]		1.12
Particle size multiplier (lb/VMT)	k (PM)	0.082
	k (PM_{10})	0.016
	k ($PM_{2.5}$)	0.0024
Emission Control Data		
Emission control method		None
Emission control removal efficiency, %		0
Emission Factor (EF) Equation [c]		
Uncontrolled EF (UEF) Equation, short-term	$UEF(lb/VMT) = k (lb/VMT) \times (sL/2)^{0.65} \times (W/3)^{1.5} \times [(1 - 1.2p/24]$	
Uncontrolled EF (UEF) Equation, annual	$UEF(lb/VMT) = k (lb/VMT) \times (sL/2)^{0.65} \times (W/3)^{1.5} \times [(1 - p/(4x365)]$	
Controlled EF (CEF) Equation	CEF(lb/VMT) = UEF (lb/VMT) x (100 - Removal efficiency (%))	
Calculated PM Emission Factor (EF)		
Uncontrolled EF, lb/VMT	Short term	1.44
	Annual	1.33
Controlled EF, lb/VMT	Short term	1.44
	Annual	1.33
Calculated PM_{10} Emission Factor (EF)		
Uncontrolled EF, lb/VMT	Short term	0.28
	Annual	0.26
Controlled EF, lb/VMT	Short Term	0.28
	Annual	0.26
Calculated $PM_{2.5}$ Emission Factor (EF)		
Uncontrolled EF, lb/VMT	Short term	0.04
	Annual	0.04
Controlled EF, lb/VMT	Short Term	0.04
	Annual	0.04
Estimated Emission Rate (ER)		
PM ER TPY (annual)		10.10
PM_{10} ER TPY (annual)		1.97
$PM_{2.5}$ ER TPY (annual)		0.29

Source: USEPA, 2006 (AP-42, Section 13.2.1 Paved Roads).

[a] Based on hourly surface meteorological data from Tallahassee, 2005.
[a] Silt loading from Golder 2001 (BBTT).
[c] AP-42 emission factor provides emission factor as pounds per vehicle mile traveled (lb/VMT).
[d] Round-trip travel distance estimated from facility plot plan.

Checked by: SKM
Reviewed by: R cay

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TABLE B-4
ESTIMATION OF PM EMISSION FACTORS AND RATES FOR TRAFFIC ON UNPAVED ROADS
WIREGRASS PLANT

Parameters		**Bulldozer for Pile Maintenance**	**Bulldozer at Truck Dumps**
Vehicle Data			
Vehicle Type		Bulldozer	Bulldozer
Vehicle capacity and load (tons)	Average weight	42	42
Operating time, hours	Daily	16	16
Operating time, days	Annual	365	365
Vehicle kilometers traveled (VKT)			
Average vehicle speed (mile/hr)		5.00	5.00
No. of vehicles		1	1
VMT (no. vehicles x vehicle speed x travel time)	Daily	80	80
	Annual	29,200	29,200
General/ Site Characteristics			
Days of precipitation greater than or	No. of Hours/Day	0	0
equal to 0.254 mm (p) [a]	No. of Days/Year	106	106
Silt content (s) (%) [b]		8.4	8.4
Particle size multiplier (lb/VMT)	k (PM)	4.9	4.9
	k (PM_{10})	1.5	1.5
	k ($PM_{2.5}$)	0.23	0.23
Constants for equations - PM	a	0.7	0.7
	b	0.45	0.45
Constants for equations - PM_{10}	a	0.9	0.9
	b	0.45	0.45
Constants for equations - $PM_{2.5}$	a	0.9	0.9
	b	0.45	0.45
Emission Control Data			
Emission control method		Watering	Watering
Emission control removal efficiency, %		75	75
Emission Factor (EF) Equation [c]			
Uncontrolled EF (UEF) Equation	UEF(lb/VMT) = k (lb/VMT) x $(s/12)^a$ x $(W/3)^b$ x [(365-P)/365]		
Controlled EF (CEF) Equation	CEF(lb/VMT) = UEF (lb/VMT) x (100 - Removal efficiency (%))		
Calculated PM Emission Factor (EF)			
Uncontrolled EF, lb/VMT	Annual	8.88	8.88
Controlled EF, lb/VMT	Annual	2.22	2.22
Calculated PM_{10} Emission Factor (EF)			
Uncontrolled EF, lb/VMT	Annual	2.53	2.53
Controlled EF, lb/VMT	Annual	0.63	0.63
Calculated $PM_{2.5}$ Emission Factor (EF)			
Uncontrolled EF, lb/VMT	Annual	0.39	0.39
Controlled EF, lb/VMT	Annual	0.10	0.10
Estimated Emission Rate (ER)			
PM ER TPY (annual)		32.42	32.42
PM_{10} ER TPY (annual)		9.24	9.24
$PM_{2.5}$ ER TPY (annual)		1.42	1.42

Source: USEPA, 2006 (AP-42, Section 13.2.2 Unpaved Roads).

[a] Based on hourly surface meteorological data from Tallahassee, 2005.

[b] Silt content is from AP 42 Table 13.2.2-1 (log yards in lumber sawmills).

[c] AP-42 emission factor provides emission factor as pounds per vehicle mile traveled (lb/VMT).

Checked by: SLM
Reviewed by: Reay

APPENDIX B

FUGITIVE EMISSION ESTIMATES FOR WIND EROSION AND VEHICULAR TRAFFIC

United States
Environmental Protection Agency
Acid Rain Program

OMB No. 2060-0258

EPA

Acid Rain Permit Application

For more information, see instructions and 40 CFR 72.30 and 72.31.

This submission is: [X] new [ ] revised [ ] for Acid Rain permit renewal

STEP 1

Identify the facility name, State, and plant (ORIS) code.

Facility (Source) Name **Wiregrass Plant**	State **GEORGIA**	Plant Code

STEP 2

Enter the unit ID# for every affected unit at the affected source in column "a."

a	b
Unit ID#	Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)
B1	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

Facility (Source) Name (from STEP 1)

Permit Requirements

STEP 3

Read the standard requirements.

(1) The designated representative of each affected source and each affected unit at the source shall:

(i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and

(ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;

(2) The owners and operators of each affected source and each affected unit at the source shall:

(i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and

(ii) Have an Acid Rain Permit.

Monitoring Requirements

(1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75.

(2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the source or unit, as appropriate, with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.

(3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements

(1) The owners and operators of each source and each affected unit at the source shall:

(i) Hold allowances, as of the allowance transfer deadline, in the source's compliance account (after deductions under 40 CFR 73.34(c)), not less than the total annual emissions of sulfur dioxide for the previous calendar year from the affected units at the source; and

(ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.

(2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.

(3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:

(i) Starting January 1, 2000, an affected unit under 40 CFR 72.6(a)(2); or

(ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3).

Sulfur Dioxide Requirements, Cont'd.

STEP 3, Cont'd.

(4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
(5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
(6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
(7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements

The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements

(1) The designated representative of an affected source that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
(2) The owners and operators of an affected source that has excess emissions in any calendar year shall:
(i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
(ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements

(1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
(i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;

Facility (Source) Name (from STEP 1)

Recordkeeping and Reporting Requirements, Cont'd.

STEP 3, Cont'd.

(ii) All emissions monitoring information, in accordance with 40 CFR part 75, provided that to the extent that 40 CFR part 75 provides for a 3-year period for recordkeeping, the 3-year period shall apply.
(iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
(iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.
(2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
(4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.
(5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.
(6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit.
(7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities

No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 shall be construed as:
(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating

Facility (Source) Name (from STEP 1)

Effect on Other Authorities, Cont'd.

STEP 3, Cont'd.

to applicable National Ambient Air Quality Standards or State Implementation Plans;
(2) Limiting the number of allowances a source can hold; *provided,* that the number of allowances held by the source shall not affect the source's obligation to comply with any other provisions of the Act;
(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

STEP 4
Read the certification statement, sign, and date.

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name **ROBERT TURNER, Director of Project Development**	
Signature Robert Turner	Date 12/16/09