Georgia-Pacific Wood Products LLC

PSD PERMIT APPLICATION

Talladega Sawmill
Talladega, Alabama

Submitted to the
Alabama Department of Environmental Management

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1. EXECUTIVE SUMMARY

Georgia-Pacific Wood Products LLC (GP) proposes to construct and operate a sawmill that produces kiln dried dimensional lumber in Talladega, Talladega County, Alabama. The new sawmill will be constructed on the site of GP's existing plywood manufacturing facility, which was permanently shut down in 2016; much of the plywood facility will be demolished to make way for the new sawmill. GP is requesting authorization to construct and operate the Talladega Sawmill through this permit application.

The Talladega Sawmill will be a new major stationary source with respect to Title V and Prevention of Significant Deterioration (PSD) permitting. Based on the potential emissions presented in Table 1.1, the facility is subject to PSD review for volatile organic compounds (VOC) only.

Table 1.1. Summary of Facility-Wide Emissions

Description	Pollutant	Potential Facility-wide Emissions
		tpy
Criteria Pollutants	PM	23.75
	PM_{10}	14.48
	$PM_{2.5}$	9.90
	SO_2	0.41
	VOC	878.87
	CO	40.10
	Lead	2.36E-04
	NO_X	31.19
Hazardous Air Pollutants	Highest Single HAP	40.10
	Total HAP	54.70
Greenhouse Gases	CO_2e	56,841.7

The scope of the proposed facility and processes are discussed within Section 2 and Appendix A; emission calculations are addressed in Section 3 and Appendix B. The regulatory applicability of the project is outlined within Section 4 including PSD and other federal regulations along with ADEM regulations. The control technology review and air quality analyses required by PSD regulation and ADEM regulations can be found in Section 5 and 6. Documentation supporting the control technology review is provided in Appendix C. ADEM required forms can be found in Appendix D. A fugitive emission control analysis and proposed monitoring and recordkeeping can be found in Appendix E and Appendix F, respectively.

GP plans to begin construction upon ADEM approval.

2. FACILITY AND PROCESS DESCRIPTION

2.1. FACILITY LOCATION

The Talladega Sawmill will be located at 400 Ironaton Cutoff Road in Talladega, Talladega County, Alabama. The location of the main process area is approximately 587,400.5 East, 3,700,970.1 North (Universal Transverse Mercator coordinates, Zone 16, WGS84). Refer to Appendix A for the Area Map for additional details.

Note that the site of the Talladega Sawmill is the former location of GP's Talladega Plywood Plant which operated under Permit No. 309-S002. The Title V permit for Talladega Plywood was rescinded on July 21, 2016.

2.2. ATTAINMENT STATUS OF AREA

The current Section 107 attainment status designations for areas within the state of Alabama are summarized in 40 CFR 81.301. Talladega County is classified as "better than national standards" for total suspended particulates (TSP, also referred to as PM, and which includes PM_{10}) and for the 1971 sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS). Talladega County is designated as "unclassifiable/attainment" for carbon monoxide (CO), the 1-hr nitrogen dioxide (NO_2) standard, the 24-hour and annual $PM_{2.5}$ standards, lead, and ozone (O_3). Talladega County is designated as "cannot be classified or better than national standards" for the annual NO_2 standard. Talladega County has not yet been designated for the 1-hour SO_2 NAAQS.

2.3. PROCESS DESCRIPTION

The Talladega Sawmill will be capable of producing about 329.6 million board feet (MMBf) of rough green lumber per year. The facility will be capable of producing about 320 MMBf kiln dried lumber per year.

2.3.1. Emission Group: Sawmill and Green End Operations

Incoming logs will typically be stored on-site prior to processing. Logs are debarked (LD) and then cut to length within the log bucking process (LB) before being routed through the sawmill (SM). The end product of this process is rough, green dimensional lumber, some of which will be sold without further processing. By-products from this operation include bark, chips, and sawdust which are conveyed and stored in various locations prior to being shipped off site.

Bark from the debarker will be conveyed to the bark hog and then to a bark storage bin before being shipped offsite (BC). Chip conveyance (CC) includes chips from the sawmill to the sawmill chipper/screen, from the chipper to rail car, through the chip cyclone (CHC) to the chip storage bin, or to the chip pile (CP) for storage prior to conveyance to the chip storage bin. The chip cyclone pneumatically conveys chips. Sawdust is conveyed (SDC) from the sawmill and sawmill chipper/screen to the sawdust storage bin. Haul Roads (RD) are utilized for shipments off site.

2.3.2. Emission Group: Continuous Drying Kilns

The rough, green lumber is sorted and stacked before being dried in a continuous lumber drying kiln. Three kilns, direct-fired with natural gas (CDK-1, CDK-2, CDK-3), are proposed at the facility. Two of the three kilns (CDK -1 and CDK-2) will have a maximum capacity 120 MMBf/yr and the third kiln (CDK-3) will have a capacity of 80 MMBf/yr. The two 120 MMBf/yr kilns will each have a 40 MMBtu/hr natural gas-fired burner and the third smaller kiln will have a 30 MMBtu/hr natural gas-fired burner. After drying, the rough lumber will be processed in the planer mill.

2.3.3. Emission Group: Planer Mill and Finished End Operations

The rough, dry lumber will be finished in the planer mill. Planer shavings and planer hog trim are conveyed to the shavings storage bin. A cyclofilter (PM) will be used to pneumatically convey shavings (SC).

2.3.4. Emission Group: Fire Pump Engine

An existing 1984 model, 250 bhp, diesel fired pump engine (FE) is present to provide water in case of emergency.

2.3.5. Emission Group: Large Storage Tanks and Trivial Storage Tanks

The facility will have a 2,000 gallon gasoline tank, 6,000 gallon diesel tank, and a 6,000 gallon lube oil tank (LST) to support operation. There will also be storage tanks on site that are classified as trivial insignificant activities (TST) per ADEM Admin. Code r. 335-3-16.

3. EMISSION CALCULATIONS

The processes involved at the Talladega Sawmill will release various criteria pollutants, non-criteria pollutants, hazardous air pollutants (HAP), and greenhouse gases (GHG) to the atmosphere. The following sections detail the selected emission factors and calculation methodologies for estimating the potential to emit (PTE) for the facility.

3.1. OVERVIEW OF EMISSION FACTORS

To calculate emissions at the facility, GP determined the appropriate emission factors and control device efficiencies to use for each emission source. Emission factors were obtained using various methodologies and sources. These include:

- National Council for Air and Stream Improvement, Inc. (NCASI);
- U.S. EPA's AP-42 Compilation of Air Emission Factors (5th Edition, Revised);
- U.S. EPA's Mandatory Greenhouse Gas Reporting Regulation (40 CFR 98);
- U.S. EPA's PMCALC Database; and
- Test data from testing conducted at similar GP and competitor facilities.

The sources of information for emission factor determination and calculation methodologies are discussed in greater detail in the following sections and in Appendix B.

3.1.1. NCASI Emission Factors

NCASI conducts research and provides technical information to all member companies through a variety of publications, including technical bulletins, special reports, handbooks, and newsletters. The emission factor information presented in the technical bulletins is typically deemed the most accurate available for the wood products industry if representative mill-specific test data or similar GP test data are unavailable.

GP utilized the Technical Bulletin No. 845, *A Comparative Study of VOC Emissions from Small-Scale and Full-Scale Lumber Kilns Drying Southern Pine*, (2002) and *Wood Products Electronic Database*, (2013) to estimate emissions of wood drying pollutants as part of this application.

To estimate the chip pile silt content, GP utilized the NCASI Special Report 15-01 Table 5.20, *Average TSP and Silt Content for Chips*. In addition, the Technical Bulletins No. 424, *Fugitive Dust Emission Factors and Control Methods Important to Forest Products Industry Manufacturing Operation*, (March 1984) Figure 10 was utilized to estimate fugitive pile emissions. GP also utilized information from NCASI July 2014 memo *for $PM_{2.5}$ Emissions from Drum Debarking* in order to speciate $PM_{2.5}$ emissions for debarking.

3.1.2. U.S. EPA AP-42 Emission Factors

Emission factors from U.S. EPA's AP-42 database (5th Edition unless otherwise noted) were utilized for natural gas combustion, no. 2 fuel oil combustion, organic liquid storage, several material handling activities, and fugitive PM emissions from the specified sources:

- Section 1.4, *Natural Gas Combustion*
- Section 3.3, *Gasoline and Diesel Industrial Engines*
- Section 3.4, *Large Stationary Diesel And All Stationary Dual-fuel Engines*
- Section 7.1, *Organic Liquid Storage Tanks*
- Section 13.2.1, *Paved Roads*
- Section 13.2.2, *Unpaved Roads*
- Section 13.2.4, *Aggregate Handling and Storage Piles*

In addition to the current AP-42 factors, emission factors from obsolete sections that are maintained in the FIRE (Factor Information Retrieval Software) were used for sawing and debarking, as these data points remain the best data available for these sources.

3.1.3. Greenhouse Gas Emission Factors

The U.S. EPA Mandatory Greenhouse Gas Reporting Rule, 40 CFR 98, emission factors and global warming potentials (GWP) from Subparts A and C were used to calculate carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emissions from natural gas and diesel combustion. Tables C-1 and C-2 of Subpart C list default CO_2, CH_4, and N_2O emission factors and high heat values for various fuel types.

3.1.4. U.S. EPA's PMCALC Database Emission Factors

A database from EPA referred to as "PMCALC" provides speciated PM data for reference in emission estimates. Emission ratios obtained from EPA's PMCALC database were used to speciate $PM_{2.5}$ emissions from PM emissions for the Sawmill and Log Bucking and $PM_{10}/PM_{2.5}$ emissions from the PM emissions for the Chip Pile.

3.1.5. Stack Test Data

Emission factors for PM, PM_{10}, $PM_{2.5}$, and VOC from the kilns are based on testing of similar GP and competitor operations. Stack testing of similar GP operations has also been used to calculate PM_{10} and $PM_{2.5}$ emissions from the chip cyclone and the condensable PM emissions from the planer mill cyclofilter. Each selected stack testing-based emission factor is explained in detail in the emission calculations included as Appendix B.

3.1.6. Vendor Data

The filterable PM, PM_{10}, and $PM_{2.5}$ potential emission rates for the planer mill cyclofilter have been based on an emissions model provided by the cyclofilter manufacturer. The chip cyclone PM emission factor is based on typical vendor data for green end cyclones. The NO_X emissions factor is based on purchasing a low NO_X burner with a guarantee of no more than 50 ppm.

3.1.7. Silt Test Data

Silt content for PM, PM_{10}, and $PM_{2.5}$ from the paved and unpaved roads is based on the average test results from a similar GP sawmill. The paved and unpaved road silt content used to derive haul road particulate emission factors is explained in detail in the emission calculations included as Appendix B.

4. REGULATORY APPLICABILITY

This section summarizes all federally enforceable and state enforceable air regulations that are potentially applicable to the Talladega Sawmill.

4.1. FEDERAL AIR QUALITY REGULATIONS

The federal regulations potentially applicable to the facility are PSD regulations in 40 CFR 52.21, New Source Performance Standards (NSPS) in 40 CFR 60, National Emission Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63, and Title V Operating Permit regulations in 40 CFR 70. A discussion of these regulations is provided in the following subsections.

4.1.1. Prevention of Significant Deterioration – 40 CFR 52.21

The federal PSD regulatory program is contained at 40 CFR 52.21 and ADEM has adopted similar rules under 335-3-14-.04 of their Air Pollution Control Regulations. The PSD regulations apply to major modifications at major stationary sources, which are those sources belonging to any one of the 28 source categories listed in the regulations that have the potential to emit more than 100 tons per year of any New Source Review (NSR) regulated pollutant, or any other stationary source which has the potential to emit more than 250 tons per year of any NSR regulated pollutant. As sawmills are not one of the 28 source categories defined in ADEM Admin. Code r. 335-3-14.04(2)(a)(1), the facility is a new major stationary source on the basis that the proposed source has the potential to emit more than 250 tons per year of a NSR regulated pollutant in accordance with ADEM Admin. Code r. 335-3-14.04(2)(a)(1)(i).

The Talladega Sawmill has a potential to emit of 878.9 tpy of VOC (a NSR regulated pollutant). Therefore, the Talladega Sawmill is a new major stationary source and must evaluate if a significant emissions increase will occur for each NSR regulated pollutant.

The Talladega Sawmill is a new source, thus the actual-to-potential test as defined in ADEM Admin Code R. 335-3-14-.04(1)(g) is used to determine if a significant emission increase will occur. The detailed potential to emit emission calculations for each operating unit is found within Appendix B. The baseline actual emissions (BAE) are equal to zero in accordance with ADEM Admin Code R. 335-3-14-.04(2)(uu)(3), since this is the initial construction and operation of the units. The sum of the difference between the PTE and BAE are compared to the significance thresholds as defined in ADEM Admin Code R. 335-3-14-.04(2)(w). The calculated PTE for the new facility compared to the Significant Emission Rate (SER) are shown in the Table 4.1.

Table 4.1. Summary of PSD Significant Emissions Increases (TPY)

Operating Units	NO_X	CO	SO_2	PM	PM_{10}	$PM_{2.5}$	VOC[1]	Lead	CO_2e
Sawmill and Green End Operations	--	--	--	19.0	6.0	1.5	--	--	--
Continuous Drying Kilns	29.3	39.7	0.3	3.0	7.1	7.1	878.4	0.0002	56,750
Planer Mill and Finished End Operations	--	--	--	1.7	1.2	1.2	--	--	--
Fire Pump Engine	1.9	0.4	0.1	0.1	0.1	0.1	0.2	--	92
Large Storage Tanks	--	--	--	--	--	--	0.3	--	--
Storage Tanks < 1,000 gallons	--	--	--	--	--	--	0.001	--	--
Total PTE	31.2	40.1	0.4	23.7	14.5	9.9	878.9	0.0002	56,842
Emissions Increases	**31.2**	**40.1**	**0.4**	**23.7**	**14.5**	**9.9**	**878.9**	**0.0002**	**56,842**
PSD SER	40	100	40	25	15	10	40	0.6	75,000
PSD Triggered?	No	No	No	No	No	No	**Yes**	No	No

A significant emission increase will occur only for VOC. As the Talladega Sawmill is subject to PSD permitting, Section 5 provides a detailed review of the Best Available Control Technology (BACT) for the control of VOC. Section 6 addresses the additional impacts, ozone review, Class I area review, and air toxics screening.

4.1.2. Compliance Assurance Monitoring – 40 CFR 64

EPA's Compliance Assurance Monitoring (CAM) requirements are implemented through Title V operating permits and apply to emissions units that use a control device to achieve compliance with an emissions limit and whose pre-controlled emissions are greater than the major source threshold. Per 40 CFR 64.1, a "control device" is "equipment other than inherent process equipment". "Inherent process equipment" is defined as "equipment that is necessary for the proper or safe functioning of the process, or material recovery equipment that the owner or operator documents is installed and operated primarily for purposes other than compliance with air pollution regulations." The Talladega Sawmill will have a Chip Cyclone (CHC) and Planer Mill Cyclofilter (PM) that operate as inherent process equipment as the primary purpose of the cyclone and cyclofilter are material recovery. Therefore, a CAM plan will not be required.

4.1.3. New Source Performance Standards – 40 CFR 60

NSPS apply to any stationary source for which standards are promulgated and at which any equipment defined as an "affected facility" in the standard is constructed, reconstructed, or modified after the effective date of the applicable standard. NSPS requirements are promulgated under 40 CFR 60 pursuant to Section 111 of the Clean Air Act.

NSPS are developed for particular industrial source categories. There are no NSPS standards that apply specifically to lumber mills. The only potentially applicable NSPS for the facility, are NSPS Subpart IIII and JJJJ for engines. However, the engine at Talladega was manufactured prior to the applicability date of NSPS Subpart IIII for Stationary Compression Ignition Internal Combustion Engines. The engine

[1] VOC emissions are presented as VOC as WPP1 for the continuous drying kilns as described in Appendix B.

design eliminates applicability of NSPS Subpart JJJJ for Stationary Spark Ignition Internal Combustion Engines.

NSPS standards are incorporated by reference into ADEM Admin. Code (ADEM Admin. Code 335-3-10).

4.1.4. National Emission Standards for Hazardous Air Pollutants – 40 CFR 63

NESHAP, federal regulations found in Title 40 CFR Parts 61 and 63, are emission standards that apply to major sources of HAPs (facilities that exceed the major source thresholds of 10 tpy of a single HAP and 25 tpy of any combination of HAPs) or specifically designated area sources under Part 63. The Part 63 NESHAP apply to sources in specifically regulated industrial source classifications (Clean Air Act Section 112(d)) or on a case-by-case basis (Clean Air Act Sections 112(g) and 112(j)) where EPA has failed to promulgate a 112(d) standard. The Talladega Sawmill facility is a major source of HAPs.

NESHAP standards are incorporated by reference into ADEM Admin. Code (ADEM Admin. Code 335-3-11).

4.1.4.1. 40 CFR Part 63 Subpart A – General Provisions

All affected sources are subject to the general provisions of Part 63 Subpart A unless specifically excluded by the source specific NESHAP. Subpart A requires initial notification, performance testing, recordkeeping, monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable. If other Part 63 subparts are applicable, the provisions of Subpart A also apply.

4.1.4.2. 40 CFR Part 63 Subpart DDDD – National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products

The Talladega Sawmill is subject to the Plywood and Composite Wood Products (PCWP) Maximum Achievable Control Technology (MACT) standard, 40 CFR 63 Subpart DDDD. This rule applies to any PCWP manufacturing facility which is a major source of HAP emissions. Lumber kilns are within the affected sources under the PCWP MACT pursuant to 40 CFR 63.2232(b), therefore, the lumber kilns are subject to this rule. However, no control requirements are specified by the rule for lumber kilns, only initial notification requirements. Per the allowance of 40 CFR 63.9(b)(1)(iii), this application for approval of construction serves as that initial notification. Per §63.9(b)(4)(v), this allowance requires a notification of the actual date of startup of the source, delivered or postmarked within 15 calendar days after that date. The startup notification will be addressed through ADEM's notification requirements for indicating completion of construction and requesting Authorization to Operate.

4.1.4.3. 40 CFR Part 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion (RICE) Engines

The facility operates a 1984 model year fire pump engine that is considered an "existing emergency stationary RICE" under 40 CFR 63.6590(a)(1)(ii) since it is rated less than 500 hp, is located at a major source of HAP emissions, and was constructed before June 12, 2006. The engine is subject to the compliance requirements of 40 CFR 63 Subpart ZZZZ including use of ultra low sulfur diesel (§63.6604(d)), completing and recording proper operation and maintenance (§63.6625(e)(2),(h),(i),

§63.6605, §63.6655 (d)), installation of a non-resettable hour meter (§63.6625(f)), and recording hours of operation (§63.6640(f), §63.6655(f)).

4.1.4.4. 40 CFR Part 63 Subpart CCCCCC – NESHAP for Gasoline Dispensing Facilities

In accordance with 40 CFR 63.11111(a), dispensing facility located at an area source of HAP ae affected sources. Because the Talladega Sawmill is a major source of HAP emissions, this subpart is not applicable.

4.1.5. Title V Operating Permits – 40 CFR 70

The Talladega Sawmill is subject to the major source operating permit requirements under Title V of the Clean Air Act. This regulation is delegated to Alabama by EPA and ADEM incorporates the Title V regulations into the state regulations in ADEM Admin. Code r. 335-3-16. An application for the operating permit will be submitted as required by ADEM within the first year of permitted units being placed into operation.

4.2. ALABAMA AIR QUALITY REGULATIONS - ADEM ADMIN. CODE 335-3

Alabama has promulgated air pollution control requirements under ADEM Admin. Code r. 335-3. Most of these regulations are part of the Alabama state implementation plan (SIP) for compliance with the Clean Air Act and most SIP regulations are federally enforceable. Generally applicable requirements, such as those pertaining to obtaining air quality permits and malfunction reporting, are not discussed because these requirements are widely recognized as being applicable to significant sources of air pollution. A brief discussion of both applicable and key non-applicable requirements is included in this section.

4.2.1. Visible Emissions

ADEM Admin. Code 335-3-4.01 limits visible emissions from facility sources to 20 percent during one six-minute period in any sixty minute period and 40 percent as an absolute maximum. This generally applicable requirement applies to all point sources at the Talladega Sawmill.

4.2.2. Fugitive Dust

ADEM Admin. Code 335-3-4.02 regulates fugitive dust and stipulates that no person shall cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. Such reasonable precautions shall include, but not be limited to, the following:

(i) Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;

(ii) Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stock piles, and other surfaces which can give rise to airborne dusts problems;

(iii) Installation and use of hoods, fans, and fabric filters (or other suitable control devices) to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting or other similar operations.

Visible fugitive dust emissions are limited to the lot line of the property on which the emissions originate.

4.2.3. Particulate Emissions from Fuel Burning Equipment

ADEM Admin. Code 335-3-4-.03(1) regulates emissions of PM based on heat input rating of the fuel burning equipment. Per ADEM Admin. Code 332-3-1-.02(ee), "Fuel-Burning Equipment" means *any equipment, device, or contrivance and all appurtenances thereto, including ducts, breeching, fuel-feeding equipment, ash removal equipment, combustion controls, stacks, and chimneys, used primarily, but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contacted by and adds no substance to the products of combustion.* The proposed continuous drying kilns (CDKs) will be direct fired and the purpose of the fire pump engine (FE) is to pump water in case of fire. Therefore, the CDKs and FE are not subject to this regulation.

4.2.4. Particulate Emissions from Process Industries - General

ADEM Admin. Code 335-3-4-.04(1) addresses PM emissions from process industries. In accordance with ADEM Admin. Code 335-3-4-.04(5), new sources subject to this rule are subject to the rules and regulations for Class 1 Counties regardless of location. All units that emit PM, except the Emergency Fire Pump Engine (FE), are subject to this generally applicable requirement as follows:

$$E = 3.59P^{0.62} \qquad (P < 30 \text{ ton/hr})$$

$$E = 17.31P^{0.16} \qquad (P \geq 30 \text{ ton/hr})$$

Where P is the process input weight rate in tons/hr and E is the allowable emission rate in lb/hr. As unrestricted potential to emit emissions calculated in accordance with the Process Weight Rate (PWR) method would cause a significant increase of PM emissions above the PSD SER, estimates of PM from the Talladega Sawmill's general processes are based on industry specific emission factors and are less than that allowed by ADEM's code as demonstrated in Table 4.2. Emission estimates are explained in detail in the emission calculations included as Appendix B.

Table 4.2. Summary of ADEM PWR and Requested Limits (TPY)

Operation	Emission Point Reference No.	Emission Group	PWR PM (lb/hr)	PWR PM (tpy)	Requested PM (lb/hr)	Requested PM (tpy)
Log Processing Debarker	LD	Sawmill and Green End Operations	29.33	128.46	0.66	1.35
Log Bucking	LB		14.75	64.62	9.77	0.91
Sawmill	SM		28.44	124.55	0.84	1.71
Chip Conveyance	CC		35.61	155.98	0.58	1.20
Bark Conveyance	BC		29.33	128.46	0.14	0.28
Chip Pile	CP		14.10	61.74	<0.001	<0.001
Sawdust Conveyance	SDC		28.44	124.55	0.13	0.27
Chip Cyclone	CHC		35.61	155.98	0.69	3.00
Roads	RD		49.04	214.80	5.11	10.23
Continuous Drying Kiln No. 1	CDK-1	Continuous Drying Kilns	32.19	141.01	0.33	1.11
Continuous Drying Kiln No. 2	CDK-2		32.19	141.01	0.33	1.11
Continuous Drying Kiln No. 3	CDK-3		30.12	131.94	0.23	0.76
Planer Mill	PM	Planer Mill and Finish End Operations	15.55	68.12	0.37	1.61
Shavings Conveyance	SC		15.55	68.12	0.02	0.06
Total PTE for PM			**390.26**	**1,709.33**	**19.21**	**23.61**

4.2.5. Sulfur Dioxide Emissions from Fuel Combustion

ADEM Admin. Code 335-3-5-.01(1) limits SO_2 emissions for Alabama from fuel combustion. The Talladega Sawmill is located in Talladega County, which is considered a Category 2 County. This limits the kiln burners and fire pump engine emissions to 4.0 lb/MMBtu. Estimates of SO_2 from the Talladega Sawmill's fuel burning equipment are based on U.S. EPA's AP-42 emission factors and are less than that allowed by ADEM's code.

4.2.6. Sulfur Dioxide Emissions from Process Industries - General

ADEM Admin. Code 335-3-5-.05 limits SO_2 emissions for Alabama for process industries not listed 335-3-5-.01 through 335-3-5-.04. The Talladega Sawmill will not have any equipment subject to this regulation.

4.2.7. Control of Organic Emissions

No provisions of ADEM Admin. Code 335-3-6 are applicable to the Talladega Sawmill. The facility does not have fixed-roof petroleum liquid storage vessels regulated under ADEM Admin. Code 335-3-6-.04 and .27 which apply to storage vessels with capacities greater than 40,000 gallons. No tanks at the facility are greater than 40,000 gallons; therefore, the regulation does not apply. Gasoline dispensing facilities are regulated under ADEM Admin. Code 335-3-6-.07. In accordance with ADEM Admin. Code

335-3-6-.07(2)(b), this rule does not apply to stationary gasoline storage tanks of less than 3,000 gallons. The gasoline tank operated by the facility is 2,000 gallons; therefore, this regulation does not apply.

4.2.8. Standards for Stationary RICE

No provisions of ADEM Admin. Code 335-3-8 are applicable to the Talladega Sawmill. Stationary reciprocating internal combustion engines are regulated under ADEM Admin. Code 335-3-8-.04. The facility has a single fire pump engine which is not a "large affected engine" as defined in ADEM Admin. Code 335-3-8-.04(2); therefore, this regulation does not apply.

5. BEST AVAILABLE CONTROL TECHNOLOGY

Pursuant to federal PSD regulation 40 CFR 52.21(j) and ADEM Admin. Code r. 335-3-14-.04(9), any new major stationary source subject to PSD review for a NSR regulated pollutant is required to include a Best Available Control Technology (BACT) analysis. As defined under the PSD regulations, ADEM Admin. Code 335-3-14-.04(2), BACT means:

> *... an emission limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under [the] Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.*

A BACT analysis is required for each new emission unit that emits a pollutant that triggers PSD. As VOC is the only NSR regulated pollutant to have emissions exceeding the applicable SER, a BACT analysis is only required the Continuous Drying Kilns (CDK-1, CDK-2, CDK-3), Emergency Fire Pump Engine (FE), and Storage Tanks (LST and TST).

5.1. BACT DETERMINATION FOR CONTINUOUS DRYING KILNS

This analysis is conducted to determine the best available control technology for VOC emissions from the kilns (CDK-1, CDK-2, CDK-3).

5.1.1. Step 1 - Identification of Control Technologies

The first step in the BACT analysis is to identify all available control technologies for each new unit and regulated pollutant required to be evaluated. Potentially applicable emission control technologies were investigated by reviewing U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC database), technical literature, control equipment vendor information, and by using process knowledge and engineering experience from similar types of units in operation at other GP owned facilities. The RBLC lists control technologies that have been approved as BACT in PSD permits issued by regulatory agencies for numerous process units. Process units in the database are grouped into categories by industry type.

A search of the RBLC database was performed to identify the emission control technologies and emission rates determined by permitting authorities as BACT for the wood products industry, wood lumber drying kilns (Process Code 30.800 in the RBLC). The results of the search indicate that no "add-on" control technologies have been implemented as part of a PSD or Lowest Achievable Emission Rule (LAER) permitting effort to control VOC emissions from lumber drying kilns regardless of drying method (batch, continuous, direct or indirect-fired). A summary of the RBLC findings is included in Table C-10 in Appendix C.

GP operates numerous lumber drying kilns (batch, continuous, direct or indirect-fired) across the United States. None of these lumber drying kilns at any of GP's manufacturing facilities utilize "add-on" pollution controls to remove VOC emissions. In addition, to the best of GP's knowledge, no lumber kilns operating in the U.S. utilize "add-on" pollution controls to remove VOCs.

While "add-on" controls have not been demonstrated for lumber drying kilns, the following control technologies have been demonstrated to reduce VOC emissions from other industrial processes. The exhaust streams generated by direct-fired CDKs would need to be treated for particulate matter emissions (emitted from the direct-fired sawdust burner into the kiln drying chamber) prior to consideration of thermal and catalytic oxidizers.

- Wet Electrostatic Precipitator (WESP) followed by Thermal Oxidation
- WESP followed by Catalytic Oxidation
- Condensation
- Carbon Adsorption
- Wet Scrubbing
- Biofiltration
- Proper Kiln Design and Operation

A brief description of each of the VOC control technologies listed above is provided in the following sections.

5.1.1.1. Thermal Oxidation with Use of Wet Electrostatic Precipitation

Thermal oxidizers work on the principle of reacting VOCs in an industrial process exhaust gas stream with oxygen in air to form carbon dioxide and water vapor as shown in the following chemical reaction:

$$\text{VOCs} + O_2 + \text{heat} \rightarrow H_2O + CO_2$$

This reaction occurs when the exhaust gases from an industrial process are heated to a sufficiently high temperature, typically 1,400-1,600°F with a residence time in the combustion chamber between one-half to one second.

Thermal oxidizers can be designed as conventional thermal units, recuperative units, or regenerative thermal oxidizers (RTOs). A conventional thermal oxidizer does not utilize heat recovery with a heat exchanger. Therefore, the supplemental fuel cost is extremely high and is not suitable for applications with high exhaust gas flow and low VOC concentrations. In a recuperative thermal oxidizer, the VOC-laden inlet gases are preheated by the combustion exhaust gas stream of the oxidizer through the use of a heat exchanger. The heat exchanger will recover as much as 95% of the heat from the exhaust gases and preheat the combustion air, thereby providing significant fuel savings (to heat up the combustion air with supplemental fuel) compared to a system that does not incorporate a heat exchanger. An RTO consists of at least two separate chambers packed with ceramic media. The VOC-laden gas enters one hot ceramic bed where the gas is heated to the desired combustion temperature. Auxiliary fuel may be required in this stage, depending on the heat content of the VOCs contained in the inlet gas stream. The gas stream is directed through the other ceramic bed, where the heat released from combustion is recovered and stored in the ceramic bed. The process gas flow then is switched so that the inlet gas stream can be preheated by the heat recovered in the ceramic bed. The RTO is operated using an alternating cycle for the two ceramic beds, recovering up to 95% of the thermal energy generated by the combustion process during normal operation. RTOs have the potential to remove more than 99% of VOCs from a gas stream, depending on the specific VOCs present in the gas stream. Based on GP's knowledge of lumber kiln exhaust gases (as lower VOC concentrations result in lower destruction values), it is assumed that an RTO could potentially achieve up to 97% VOC destruction, as long as the exhaust gas stream did not contain contaminants or other materials that might interfere with the operation of the control system.

RTO performance is affected by the quality of filterable particulate matter (PM) and condensable PM (CPM) contained in the exhaust gas stream. Therefore, to avoid interference from PM or CPM contained in the exhaust gas stream, as much PM and CPM as possible should be removed prior to the exhaust gas entering the RTO. The placement of a WESP ahead of an RTO has been used in the oriented strand board (OSB) industry to remove PM and some CPM as well as VOC emissions from rotary driers. WESPs are used instead of dry ESPs when wet, sticky, or flammable PM and CPM is contained in the exhaust gas stream, making it a preferred method of PM and CPM removal prior to the exhaust gases entering an RTO. PM removal efficiencies of the WESP range from 90 - 99+%, depending upon the design of the WESP and the specific characteristics of the PM contained in the exhaust gas stream. WESPs are not usually designed to remove CPM with the same high control efficiencies as PM.

5.1.1.2. Regenerative Catalytic Oxidation with Use of Wet Electrostatic Precipitation

Similar to an RTO, a regenerative catalytic oxidizer (RCO) oxidizes VOCs to carbon dioxide and water vapor using a metallic catalyst. An RCO allows the oxidation of VOCs to take place at a much lower temperature compared to an RTO. Oxidation of VOCs in an RCO usually takes place at temperatures ranging from 500-600°F. This creates the opportunity to reduce fuel expenses and materials of construction costs for the RTO (since the materials of construction will be subject to much lower temperatures, thereby reducing the risk of rapid corrosion or deterioration of the materials of construction). The addition of a combustion air preheater will further reduce the fuel costs. These types of oxidizers are just as capable in removing VOCs from a gas stream. VOC destruction efficiencies have the potential to be 95% or greater, depending on the specific VOC compounds present in the exhaust gas stream. Based on GP's knowledge of the exhaust gases from a lumber kiln (as lower VOC concentrations result in lower destruction values), it is assumed that an RCO would achieve a minimum VOC destruction efficiency of 90%.

PM removal is even more critical for RCOs than RTOs as the catalyst may be blinded by PM build-up, and as a result, may operate at much lower conversion efficiencies, or if the PM build-up is significant, the catalyst may not work at all to remove VOC emissions. Additionally, RCOs are sensitive to poisoning from heavy metals present in the exhaust gas stream. As such, it is necessary to remove PM emissions prior to directing the exhaust gases through the RCO. WESPs have the highest PM control efficiency for this type of system, compared to wet scrubbers or high efficiency cyclones. WESPs can have PM removal efficiencies of 90-99+%, depending upon the particle size fraction of the PM material being removed from the exhaust gas stream.

5.1.1.3. Condensation

Condensation systems remove VOC emissions by condensing VOCs within the exhaust gas stream by either increasing pressure or lowering the temperature of the exhaust gases. The condensed VOCs are then destroyed in a separate combustion device or the materials are recovered for sale. Condensation requires that the exhaust stream be cooled to a temperature low enough such that the vapor pressure of the exhaust gases are lower than the VOC concentration of the exhaust gases.

5.1.1.4. Carbon Adsorption

Carbon adsorption systems can potentially be used to remove VOCs from exhaust gas streams. The core component of a carbon adsorption system is an activated carbon bed contained in a steel vessel. The VOC-laden exhaust gases pass through the carbon bed where the VOC is adsorbed on the activated carbon. The cleaned gas is discharged to the atmosphere. The spent carbon is regenerated either at an on-site regeneration facility or by an off-site activated carbon supplier. One method used to regenerate spent activated carbon is by using steam to displace adsorbed organic compounds at high temperatures.[2]

The VOC removal efficiency is dependent upon the absorption capacity for each of the specific organic compounds that make-up the exhaust gas stream. The adsorption capacity for a particular contaminant represents the amount of the contaminant that can be adsorbed on a unit weight of activated carbon consumed at the conditions present in the application. Typical adsorption capacities for moderately adsorbed compounds range from 5 to 30% of the weight of the carbon. In the adsorption process, molecules of a contaminated gas stream are attracted to and accumulate on the surface of the activated carbon. Carbon is a commonly used adsorbent due to its very large surface area. While most organic compounds will adsorb on activated carbon to some degree, the adsorption process is most effective on higher molecular weight and high boiling point compounds. Compounds having a molecular weight over 50 and a boiling point greater than 50°C are good candidates for adsorption.

5.1.1.5. Wet Scrubbing

Scrubbing of VOCs contained in an exhaust gas stream is usually accomplished in a packed column (or other type of column) where the VOCs are absorbed by countercurrent flow of a scrubbing liquid. Scrubbing liquids include water, a caustic solution, or another liquid media that will interact to remove the VOC compounds. Wet scrubbing is most effective for water soluble VOC compounds, such as alcohols. Removal efficiencies for hydrophilic VOCs (VOCs that mix, dissolve or are wetted by water) can exceed 90%, depending upon the specific chemical compounds that make-up the VOCs within the exhaust gas stream. The VOC compounds to be scrubbed from the exhaust gas stream must be soluble in the absorbing liquid and even then, for any given absorbent liquid, only VOCs that are soluble in the scrubbing liquid can be removed.

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[2] Shepard, Austin. Activated Carbon Adsorption for Treatment of VOC Emissions. Presented at 13th Annual EnviroExpo, Boston Massachusetts- May 2001. http://www.carbtrol.com/voc.pdf.

5.1.1.6. Biofiltration

Biofiltration is a technology where a VOC-laden exhaust stream is directed through a biologically active media. Biofiltration uses microorganisms to break down organic compounds into carbon dioxide, water, and salts. When the biofilter is built, the microorganisms are already on the material that is used as a filter bed. The filter bed material normally used is peat, soil, or compost, but granulated activated carbon and polystyrene can also be used. The choice of filter bed material is very important because it has to supply the nutrients for the microorganisms, support biological growth, and have good sorption capacity.

The biological process is oxidation by microorganisms and can be written as follows:

$$VOC + O_2 + \text{microorganisms} + \text{nutrients} \rightarrow CO_2 + H_2O + \text{Heat} + \text{microorganisms}$$

The microorganisms live in a thin layer of moisture, or the "biofilm", which is built around the particles of the filter material. The contaminated gas stream is diffused through the biofilter and adsorbed onto the biofilm. The biofilm is the where the oxidation process actually takes place. The VOCs contained in the exhaust gas stream are not permanently transferred to the filter bed material.

Temperature, oxygen level, and pH of the exhaust gas stream affect the level of VOC removal. Microorganisms work best when the temperature is between 85 and 105°F. Gas stream temperatures well above 105°F will kill the bacteria contained in the filter media and thereby negate its effectiveness. Also, since most of the biological degradations are aerobic in nature, the oxygen level is very important in the biofiltration process. In fact, oxygen is not used directly in the gaseous form, but the microorganisms use the oxygen present in the dissolved form in the biofilm. The microorganisms are most efficient at neutral pH values (pH around 7). Thus, the pH level of the contaminated gas stream must be maintained at a neutral level.

Biofilters are most effective in removing water soluble VOC compounds and have demonstrated removal efficiencies for individual hydrophilic compounds such as methanol and formaldehyde that exceed 90%. Vendors claim that this technology has the capability to remove approximately 50-70% of the total VOC emitted from a gas stream (comprised of VOC compounds with varying degrees of water solubility) when used under favorable operating conditions of low temperature, readily available oxygen, and neutral pH conditions. Based on GP's familiarity with the operation of biofiltration units on other process units within the Building Products Industry, the control efficiency is likely much lower than the vendor claims. Stack test data for the Board Press at the Weyerhaeuser Oriented Strand Board facility in Elkin, NC, indicates that the biofilter only achieves approximately 15 percent control of total VOCs. Stack test data for the Board Press at GP's Particleboard facility in Thomson, GA, indicates that the biofilter only achieves approximately 10 percent control of total VOCs (February 12, 2009). The aforementioned control efficiencies are based on total VOC presented on a carbon basis.

5.1.1.7. Proper Kiln Design and Operation

The naturally-occurring VOCs in lumber are driven-off from the heat used to dry the lumber within the kiln. Lumber is dried to specific moisture content for quality control purposes. Proper design and operation of the lumber kilns prevents over drying of the lumber that may release additional VOCs to the atmosphere. As a result, proper operation of the kilns will minimize VOC emissions to the atmosphere.

5.1.2. Step 2 - Technical Feasibility Analysis

The second step in the BACT assessment is the elimination of any technically infeasible control technologies discussed in Step 1. Each control technology presented in Step 1 is considered and those that are clearly technically infeasible are eliminated. If a control technology has been installed and operated successfully on a similar emission source, then it is assumed to have been demonstrated in practice and is considered technically feasible. If a control technology has not been demonstrated on a similar source, then the applicant must determine if the technology is applicable to the emission source under consideration. A control technology is eliminated from further consideration if it is shown that the technology has not been demonstrated on similar emission sources and that it also is not commercially available or it cannot be applied to the emissions source under consideration.

To the best of GP's knowledge, no control technologies for the removal of VOC emissions have been applied to, or demonstrated for lumber kilns (batch or continuous), or upon exhaust gas streams with a similar characteristics to the exhaust gases from lumber kilns. There are a number of inherent difficulties in designing a technically feasible control system for a lumber kiln. Because no emission control technologies have been applied to lumber kilns, actual operational and maintenance problems are not fully understood. Basic technical challenges identified with controlling lumber kilns with the use of several potential control technologies, are categorized as follows:

- Exhaust gas collection, and
- Collection and treatment of condensate.

Sections 5.1.2.1 and 5.1.2.2 address the technical challenges listed above and how these challenges affect the ability of applying emission controls to lumber kilns. Sections 5.1.2.3 – 5.1.2.8 provide detailed discussions for each control technology with regards to technical challenges to control VOC emissions from the lumber kilns.

5.1.2.1. Exhaust Gas Collection

Drying within continuous lumber kilns is facilitated by combustion air from a natural gas-fired burner mixed with circulating air in a blend chamber. A centrifugal blower forces the heated air through a duct into a plenum that distributes the air to circulating fans inside of the kiln. The heated air transfers moisture from the lumber to the air that is circulated throughout the kiln. Heated air from the process is directed through openings at both ends of the kiln. The doorway openings at the ends of continuous kilns must remain open at all times to facilitate the continuous loading and unloading of lumber. The process exhaust air (including products of combustion from the direct-fired burner and VOCs from lumber drying) are vented through these openings and through one or more powered vent exhaust stacks located just inside of and above the doorway openings of the continuous kiln. Powered exhaust vents are a technology that Georgia-Pacific has employed on continuous kilns. This technology results in an estimated 80% of the exhaust air being directed through the powered vent exhaust stacks, and the remaining 20% exhausted through the doorway openings of the kiln.

5.1.2.2. Collection and Treatment of Condensation

The process air both within and exhausted from the kiln has a relative humidity of 100%. While the drying section within the kiln may reach temperatures up to 250°F, the temperature of the exhaust gases from both of the doorway openings on both ends of the kiln, as well as the exhaust stacks, is typically between 110°F and 150°F. If the temperature of the process exhaust gas stream is not maintained, the exhaust gases will cool as they flow from the exhaust stack through the ductwork to a selected VOC control device. As the temperature of the process exhaust gas is reduced, water and VOC constituents from the process air will condense and be deposited on the inside of the ductwork. Condensation of material inside of the walls of the ductwork poses several problems including the quantity generated, the weight of the water buildup, and the buildup of "stickies" from the condensation of VOC-containing compounds. The lumber enters the kiln with a moisture content of approximately 48% and is dried to a moisture content of approximately 13%. An estimated 0.23 gallons of water per board foot is removed from southern yellow pine during the drying process[3]. For kilns that processes 320,000 thousand board feet per year (MBF/yr), a total of 73.6 million gallons of water per year will be removed. The weight of the condensate generated could cause the exhaust ductwork to collapse without extensive design and support and a drainage system to capture and discharge the condensate to a wastewater treatment system. Handling, treating and discharging this quantity of condensate is considered technically infeasible for many of the lumber kilns GP operates for several reasons. First, all of the facilities are designated as zero wastewater discharge facilities. Secondly, most do not have an onsite wastewater treatment facility to treat the condensate or access to a publicly-owned treatment works to treat the condensate.

In addition to the quantity and weight of condensate buildup in the exhaust ductwork, kiln condensate is very "sticky" due to the presence of resinous compounds in the exhaust gases, and points of condensation will, over time, build-up and could cause severe blockages and malfunctions of dampers and ductwork connections. The quantity of "stickies" that might build-up is unknown, but severe control system malfunctions are likely as well as a large amount of time and labor expended to clean out the build-up of sticky material, based on previous and current experience within our wood products facilities. Also, stickies are very flammable and would require a robust fire detection and suppression system within the ductwork to prevent fires and/or explosions that could be caused by a spark from the direct fired kiln.

To avoid generating a large quantity of condensate (containing both water and stickies), that would otherwise be considered technically infeasible to manage, GP proposes to heat the process air exiting the kiln exhaust stacks to a temperature above the point of condensation. Based on previous experience with condensation within GP plywood, OSB and particleboard capture and control systems, GP concludes the process air captured from the kiln exhaust stacks would need to be heated to a minimum of 200°F in order to capture and treat VOCs in the exhaust gas stream and without any condensation taking place.

5.1.2.3. Wet Electrostatic Precipitator (WESP) followed by Thermal Oxidation

As previously mentioned, RTO performance can be affected by PM contained in the exhaust gas stream. Therefore, PM emissions must be removed from the exhaust gas stream prior to entering the RTO. PM emissions from the lumber drying process could lead to ceramic bed fouling, performance degradation or even fires as the PM becomes entrained on the ceramic media bed. Depending on the design of the ceramic media contained in the bed, PM buildup could lead to plugging or blocked airflow of the bed resulting in an increase in the pressure drop across the bed. This in turn will require the exhaust fan to work harder and consume more energy to overcome the pressure drop. Fouling of the ceramic media bed with PM reduces the effectiveness of the ceramic media's ability to transfer heat. At the same time, the

[3] (USDA Agricultural Handbook AH-188: Dry Kiln Operator's Manual) http://www.fpl.fs.fed.us/products/publications/several_pubs.php?grouping_id=101&header_id=p

buildup of PM presents a serious fire hazard (especially in the presence of "stickies" generated by heating the wood).

To minimize the PM build-up on the ceramic media bed, WESPs placed ahead of the RTO is one method currently being used in several GP OSB facilities to control VOC and PM emissions from rotary dryers. GP has determined through experience at other facilities that ceramic media bed fouling is still an issue, even with a WESP situated ahead of the RTO on a direct fired dryer. The bed fouling can lead to a reduced life span of the ceramic media that required complete replacement of the media more frequently than expected. While ceramic media bed fouling over the life of an RTO does not render the operation of a WESP/RTO control system technically infeasible, it does add to the operating cost of the control system unit, which will be addressed under Step 4 of this BACT analysis.

5.1.2.4. Wet Electrostatic Precipitation & Catalytic Oxidation

PM removal is even more critical for RCOs than RTOs as the catalyst may be blinded by the build-up of PM. RCOs are also sensitive to poisoning by heavy metals that may be contained in the exhaust gas stream. As such, PM removal is necessary in order to prevent blinding of the catalyst inside of the RCO. Blinding of the catalyst occurs when PM coats the catalyst, thereby preventing the coated sections of the catalyst from oxidizing the VOCs contained in the exhaust gas stream. The RCO catalyst is also sensitive to poisoning with exhaust gas streams that contain silicon, phosphorous, arsenic, and many other heavy metals. While the build-up of PM on the catalyst may be reversed by burning away the PM, metallic poisoning requires replacement of the catalyst as the metals become chemically bound to the active surface which reduces the total surface area capable of promoting oxidation. GP has placed RCO media baskets within OSB control systems including a system utilizing a WESP and RTO. After a three month period of operation, the sample baskets were removed and analyzed. The control systems not utilizing a WESP were blinded or poisoned by PM build-up to the point that the exhaust gases were unable to come into intimate contact with the catalyst. Catalyst removed from the OSB dryer employing a WESP showed some blinding and significant poisoning. Discussions with the catalyst vendor indicated that catalytic oxidation using an RCO is not a viable control technology for this type of exhaust gas stream due to the PM, metals, and acidic content of the exhaust gases, even with the use of a WESP. Based on this analysis, this control technology is considered technically infeasible and will not be discussed any further.

5.1.2.5. Condensation

Condensation requires that the exhaust stream be cooled to a temperature low enough such that the vapor pressure of the exhaust gases are lower than the VOC concentration of the exhaust gases. The primary constituent of the VOC in the exhaust gas stream from the lumber kilns is terpenes, which would require the temperature of the exhaust stream to be lowered to well below 32°F in order to have a vapor pressure low enough to use condensation. A temperature of 32°F would cause the water vapor in the stream to freeze, and the resulting ice particles would clog the condensation unit. As such, condensation is not technically feasible to control VOC emissions from a lumber kiln.

5.1.2.6. Carbon Adsorption

Carbon adsorption systems work on the principle that VOCs within the exhaust gases condense on the surface of the adsorbent, which is usually activated carbon. Once the activated carbon surface has adsorbed all the VOCs possible, the VOC is desorbed, usually with steam, to regenerate the activated carbon. Humidity within an exhaust gas has a noticeable effect on the absorption of VOCs using activated carbon, as the water vapor will condense on the adsorbent in addition to the VOC. One study reported desorbing of VOC from the carbon as water displaced the VOC[4]. The presence of water in exhaust gases will decrease the ability of VOCs to be absorbed. As previously mentioned, exhaust gases from lumber drying kilns have a relative humidity of 100%; therefore the humidity of the exhaust gas will compete with VOC adsorption and greatly reduce the VOC control efficiency of the unit.

Although some VOCs can be desorbed with the use of a chemical treatment, terpenes, the primary VOC constituent in kiln exhaust gases, must be thermally desorbed. As a result, the temperature necessary for desorption are excessively high and would likely damage any commercially-available adsorption media.[5] The adsorption capacity of an activated carbon system is higher with lower exhaust gas temperatures since desorption takes place near the boiling point of the VOC within the exhaust gas. As previously mentioned, GP proposes to heat the exhaust gas above 200°F to prevent any condensation of the exhaust gas stream taking place in the ductwork. This temperature is above the boiling point for some of the VOC components within the exhaust gas (e.g. formaldehyde and methanol). Therefore, VOC control is expected to be greatly reduced at this high exhaust temperature. It is also likely that the "stickies" contained in the kiln exhaust gas stream would plug the activated carbon bed with a build-up of condensable PM. Based on all of these reasons, this control technology is considered technically infeasible and will not be discussed further.

5.1.2.7. Wet Scrubbing

Wet scrubbing is most effective for exhaust gas streams that contain water soluble VOC compounds, such as methanol. However, the primary VOC constituents of kiln exhaust gases, pinenes and terpenes, are not water soluble. Therefore, these constituents would not be easily adsorbed in a wet scrubber, and the VOC removal efficiency would be quite low, on the order of 10-20%. In addition, the viscous nature of the "stickies" within the exhaust gas will easily plug the scrubber absorption media. Therefore, this control technology is considered technically infeasible and will not be discussed further.

5.1.2.8. Biofiltration

To the best of our knowledge, no vendor has designed a biofiltration system to remove VOC emissions from an exhaust gas stream with characteristics similar to those from a lumber kiln. As previously discussed, to prevent condensation and the buildup of "stickies" inside of the exhaust ductwork between the kiln and control equipment, GP believes it would be necessary to heat the kiln exhaust gases to temperatures above that which condensation would occur, or above 200°F. Exhaust gas stream temperatures well above 105°F would kill the bacteria contained in the filter media of the biofilter and thereby render the system ineffective.

As previously mentioned, the primary constituents in the exhaust gas are pinenes and terpenes, which are insoluble in water. The biofilter will be ineffective at breaking down pinenes and terpenes. Additionally, due to the highly viscous nature ("sticky") of these compounds, VOCs are expected to build-up within the biofilter bed, plugging the media, and reducing its effectiveness.

[4] U.S. EPA, "Technical Bulletin - Choosing an adsorption System for VOC", EPA 456/F-99-004, May 1999 http://www.epa.gov/ttn/catc/dir1/fadsorb.pdf

[5] Georgia EPD, "Prevention of Significant Air Quality Deterioration Review of the Langdale Forest Products Co. Valdosta, Georgia (Lowndes County)." Preliminary Determination, Permit Application No. 18039 October 7, 2008. http://www.georgiaair.org/airpermit/downloads/permits/18500009/psd18039/1850009pd.pdf

GP has looked at biofiltration in depth with a vendor that utilizes newer technology compared to the traditional control systems that utilize bioactive media such as soil, peat or compost. However, the company has not yet constructed a commercial system, or even a pilot plant, that had demonstrated effective removal of VOCs from lumber kiln exhaust gases, or anything similar. The use of biofiltration to remove VOCs from a lumber kiln exhaust gas stream is therefore deemed technically infeasible and will not be discussed further.

5.1.3. Step 3 - Ranking of Control Technologies by Control Efficiency

Although the technical feasibility of capturing and transporting kiln exhaust gases to a pollution control system is questionable for the reasons outlined in Sections 5.1.2.1 and 5.1.2.2, GP is considering the use of a WESP followed by an RTO in more detail to assure that all possible control technologies have been thoroughly examined as part of this BACT analysis. A summary of the VOC control efficiencies of the remaining technically feasible control technologies, ranked in order of control effectiveness, is presented below.

- WESP/RTO = 95[6]%
- Work Practices = base case, no additional reduction

5.1.4. Step 4 – Cost Effectiveness Evaluation of Control Technologies

The fourth step in the top-down BACT assessment procedure is to evaluate the cost effectiveness of the control technologies that are were not eliminated in Step 2 and document the results.

5.1.4.1. Economic Costs

The control technologies considered in the analysis result in significant capital and operating costs. It is also likely that the costs included in this BACT analysis are underestimated due to difficulty of accurately estimating a system that has not been demonstrated in practice. Unknown maintenance, operational, and engineering problems due to the unique characteristics of lumber kiln exhaust gases could result in higher costs than those presented in this step of the BACT analysis.

Based on engineering estimates, the cost estimate analysis assumes the Talladega Sawmill would install two WESP followed by an RTO (one WESP/RTO to control CDK-1 and the other WESP/RTO to control CDK-2 and CDK-3). The cost of controlling VOC emissions with a WESP followed by an RTO is estimated at approximately $12,303 per ton of VOC as carbon (C) ($9,591 per ton of VOC as WPP1) removed from CDK-1 and $12,142 per ton of VOC as C ($9,466 per ton of VOC as WPP1) from CDK-2 and CDK-3 based on the results shown in the detailed cost effectiveness spreadsheet provided in Appendix C.[7] This cost effectiveness value is largely due to the cost of heating the lumber kiln exhaust air to a temperature of approximately 200°F to prevent condensation and the formation of "stickies" in the exhaust ductwork exiting the kiln, leading into the control system. Based on the high cost effectiveness

[6] Higher RTO VOC control values have been demonstrated for some applications, but high control is not expected for low concentration high flow applications like those at the CDKs.
[7] Note that the cost per ton was calculated based on both an as carbon basis and WPP1 basis. The as carbon basis was used for comparison to the other RBLC entries which typically use as carbon. In addition, GP has received guidance from other states to calculate cost per ton on an as carbon basis.

value for removing VOCs from the lumber kilns using a WESP followed by an RTO, GP does not believe it is economically feasible to use this control technology.

5.1.4.2. Environmental Impacts

There are energy and environmental impacts associated with the use and combustion of natural gas in the RTO. The combustion of natural gas as an RTO fuel would create additional NO_X, CO, and CO_2 emissions. The generation of these emissions simply to reduce VOC emissions may result in a net negative environmental effect.

The reduction of VOC emissions from a lumber kiln, and the very small quantities of HAPs and toxic air pollutants (TAPs), would have a negligible impact on air quality in the vicinity of the facility. Under the PSD program, VOCs are regulated to prevent significant deterioration of air quality due to ozone formation. Ozone is formed in the atmosphere due to atmospheric chemical reactions of NO_X and VOCs that are oxidized in the presence of sunlight excessive concentrations of ozone in the lower atmosphere can be injurious to human health and damage vegetation. The facility is located in a lightly populated and developed area of Alabama and ambient concentrations of ozone in this area are in attainment with the NAAQS for this pollutant. Moreover, it should also be noted that VOC emissions from the lumber kilns are small compared to the biogenic (naturally occurring) VOC emissions generated by the forested areas in the vicinity of the facility and, consequently, any reduction of VOC emissions from the lumber kilns will have a negligible effect upon ozone formation and ozone concentrations in the area.

The southeast is NO_X limited with respect to ozone formation. Therefore, small increases in NO_X (i.e., generated from natural gas combustion of an RTO) could result in increased ozone, while relatively larger increases in VOC will likely not result in ozone increases.

5.1.4.3. Energy Impacts

The control technologies require energy to operate fans to move the exhaust gases through a significant amount of ductwork, requiring significant electricity for a WESP/RTO control system. The indirect heated ducting and the RTO also require the use of supplemental fuel to heat the ductwork and maintain the appropriate combustion temperature within the RTO.

5.1.4.4. Proper Kiln Design and Operation

The only economically cost effective control technology for removing VOC emissions from a continuous lumber kiln is the use of "proper design and operating practices". Since this control option is the top remaining BACT control technology, after showing that other "add-on" control systems were not technically or economically feasible, a cost effectiveness evaluation is not required.

5.1.5. Step 5 - Select BACT

Results of the top-down BACT analysis indicate that there are no demonstrated control techniques in practice, numerous technical challenges, and no cost-effective add-on control technologies for removing VOC emissions from lumber drying kilns and, consequently, the BACT proposed for the lumber kilns is "no control" with the use of "proper design and operating practices" as BACT. GP proposes a VOC emission limit of 5.49 lb/MBf as WPP1 as BACT. This BACT limit applies during all operating conditions as there are no significant changes to the VOC emissions generated by the kilns during startup and shutdown compared to normal operation.

The proposed BACT work practices for the continuous lumber kilns consist of (1) proper kiln maintenance and (2) minimizing over-drying while meeting the relevant lumber moisture specifications.

Limiting over-drying has a direct impact on the minimization of VOC emissions. The VOCs emitted from southern pine lumber drying consist of approximately 80-90% terpenes and pinenes which are native compounds in the wood. Emissions of these compounds are largely proportional to the amount of moisture removed from the lumber as it is dried inside the kilns.

GP proposes to demonstrate compliance with these work practices by measuring the moisture content of the kiln dried lumber. Due to seasonal variability of wood moisture content and drying times, GP proposes a rolling 12-month average for comparison to the established moisture content target. In addition to monitoring moisture content, following a preventative maintenance plan will assist in minimizing VOC emissions. Proper maintenance of kiln equipment ensures optimal drying conditions which minimizes the possibility of over-drying. Due to the relatively new nature of continuous kilns, best performance and maintenance parameters may need to be updated as experience is gained through kiln operation, thus GP proposes to develop and implement an operating and maintenance plan within 180 days of start-up of the continuous kiln. The development of site specific plans for proper kiln operation and maintenance is consistent with recent BACT determinations in EPA Region 4.

5.2. BACT DETERMINATION FOR EMERGENCY FIRE PUMP ENGINE

This analysis is being conducted to determine the best available control technology for VOC emissions. An emergency fire pump engine (FE) is proposed for the Talladega Sawmill. Combustion of ultra-low sulfur diesel (ULSD) in the units will result in emissions of VOC. The engine will be subject to the requirements of NESHAP Subpart ZZZZ.

5.2.1. Step 1 - Identification of Control Technologies

A RBLC search was completed for small (<500 bhp) internal combustion engines (process type 17.21 – fuel oil). The search was further refined to exclude entries without sufficient information to determine a VOC limit. Additionally, the search was refined to exclude engine sizes outside of the range set by 40 CFR 60 Subpart IIII for engines with the same emission limitations (≥130 bkW and ≤560 bkW). The results of this search are included in Table C-11 in Appendix C. The emission limits in the database were converted into lb/hp-hr for comparison purposes. All units indicate no control or good design and/or combustions practices for VOC. Though not historically used for BACT, a list of possible control technologies for an engine is provided below.

- Diesel Oxidation Catalyst
- Good Combustion Practices and Maintenance

5.2.2. Step 2 - Technical Feasibility Analysis

Reduction of non-methane hydrocarbon or VOC emissions from engines can be achieved from add on control such as exhaust treatment catalyst or through good combustion practices and proper maintenance. These options have variable control efficiency depending on engine size, design, and age.

5.2.3. Step 3 - Ranking of Control Technologies by Control Efficiency

All add on control and good combustion practices control technologies are technically feasible. Engine control technologies are primarily directed at limiting NO_X and CO emissions, since they are the primary pollutants emitted. As a result, there is little information on the control efficiency of VOC for each technology. However, there is information on the control efficiency of petroleum hydrocarbon (HC)[8], which can be used as a surrogate control of VOC. The level of control for HCs is expected to be greater than the actual control of total VOCs. A summary of the VOC control efficiencies of the technically feasible control technologies, ranked in order of HC control effectiveness, is presented below.

- Diesel Oxidation Catalyst = 40-75% of HC
- Good Combustion Practices and Maintenance = base case, no additional reduction

5.2.4. Step 4 – Cost Effectiveness Evaluation of Control Technologies

The engine is for emergency use only; the use of the engine and resulting potential emissions of 0.2 tpy (based on 500 hrs/yr operation). The actual use of the engine will be well below potential as the engine is only used in the event of a fire (and periodic testing for unit readiness). GP does not believe that the cost per ton of VOC emission reduction through any of the above add on control technologies for this engine are economically feasible.

5.2.5. Step 5 - Select BACT

Results of the top-down BACT analysis indicate that there are no cost-effective add-on control technologies for removing VOC emission from an emergency fire pump engine, and consequently, the BACT proposed for the emergency fire pump engine is "no control" with the use of "good combustion practices including proper engine maintenance and operation" as BACT. There are no applicable NSPS or NESHAP limits on VOC emissions for a 1984 model year emergency fire pump engine. NESHAP Subpart ZZZZ contains total hydrocarbon (THC) limits for some engines, however these limits only apply to non-emergency engines and are not applicable to emergency engines. NSPS Subpart IIII contains some hydrocarbon (HC) or HC + NOx limits, but pre-2006 model engines are not subject to NSPS Subpart IIII. Therefore, GP proposes an emission limit of 0.00251 lb/hp-hr TOC. This BACT limit applies during all operating conditions as there are no significant changes to the VOC emissions generated by the engine during startup and shutdown compared to normal operation. (Note that the given the engine is a 1984 model year, the emission limit is expected to be achievable based on the emission factors within AP-42 Section 3.3 Gasoline And Diesel Industrial Engines, Table 3.3-1).

5.3. BACT DETERMINATION FOR PETROLEUM PRODUCT STORAGE TANKS

This analysis is being conducted to determine the best available control technology for VOC emissions. GP will have diesel and oil storage tanks with capacities ranging from 250 gallons to 6,000 gallons (LST-

[8] U.S. EPA, "Technical Bulletin - Diesel Oxidation Catalyst General Information", https://www.epa.gov/sites/production/files/2016-03/documents/420f10029.pdf

2, LST-3, and TST). Emissions result from evaporative loss of the stored liquid and from changes in the liquid level.

5.3.1. Step 1 - Identification of Control Technologies

A RBLC search was completed for tanks (process type 42.005 – petroleum liquid storage in fixed roof tanks). The results of this search are included in Table C-12 in Appendix C. General control of tank emission of VOC is provided below.

- Vapor collection and add on control
- Submerged fill/bottom loading
- Tank color

5.3.2. Step 2 - Technical Feasibility Analysis

All options listed above are technically feasible for the reduction of VOC off the petroleum product storage tanks. The add-on controls (such as carbon adsorption, RTO, RCO, condensation, biofiltration, and scrubbing) would require collection of the vapors through vapor recovery. Vapor recovery captures the organic vapors generated or displaced. Submerged fill and tank color are process equipment design parameters.

5.3.3. Step 3 - Ranking of Control Technologies by Control Efficiency

The color of a tank color can impact the solar absorption to various degrees and its actual control of VOCs depending on many factors. A summary of the VOC control efficiencies of the technically feasible control technologies, ranked in order of HC control effectiveness, is presented below.

- Vapor collection and add on control = 99%
- Submerged fill/bottom loading = 40%
- Tank color = Varies

5.3.4. Step 4 – Cost Effectiveness Evaluation of Control Technologies

The tanks are located throughout the facility and vapor collection with add on control would require a significant amount of ductwork in addition to the add on control system. In addition, as many add on controls require adverse energy use and generate other pollutants by their operation, control equipment does not support the possible reduction of VOC emissions, which are currently less than 0.01 tpy. GP does not believe that the cost per ton of VOC emission reduction through any vapor recover with add on control, or submerged fill/bottom loading technologies are economically feasible.

5.3.5. Step 5 - Select BACT

As the only remaining reduction option, GP proposes using tank color as BACT for VOC from storage tanks, ensuring all tanks storing organic liquids are light in color. The emission limit proposed for these tanks include this control factor, therefore BACT is proposed as the calculated hourly potential emissions.

5.4. BACT DETERMINATION FOR GASOLINE STORAGE TANK

This analysis is being conducted to determine the best available control technology for VOC emissions. GP will have a gasoline tank (LST-1) with capacity of 1,000 gallons. Emissions result from evaporative loss of the stored liquid and from changes in the liquid level.

5.4.1. Step 1 - Identification of Control Technologies

A RBLC search was completed for tanks (process type 42.005 – petroleum liquid storage in fixed roof tanks). The results of this search are included in Table C-12 in Appendix C. General control of tank emission of VOC is provided below.

- Vapor collection and add on control
- Submerged fill/bottom loading
- Tank color

5.4.2. Step 2 - Technical Feasibility Analysis

All options listed above are technically feasible for the reduction of VOC off the petroleum product storage tanks. The add-on controls (such as carbon adsorption, RTO, RCO, condensation, biofiltration, and scrubbing) would require collection of the vapors through vapor recovery. Vapor recovery captures the organic vapors generated or displaced. Submerged fill and tank color are process equipment design parameters.

5.4.3. Step 3 - Ranking of Control Technologies by Control Efficiency

The color of a tank color can impact the solar absorption to various degrees and its actual control of VOCs depending on many factors. A summary of the VOC control efficiencies of the technically feasible control technologies, ranked in order of HC control effectiveness, is presented below.

- Vapor collection and add on control = 99%
- Submerged fill/bottom loading = 40%
- Tank color = Varies

5.4.4. Step 4 – Cost Effectiveness Evaluation of Control Technologies

Many add on controls require adverse energy use and generate other pollutants by the operation of control equipment do not support the possible reduction of VOC emissions, which are currently less than 0.32 tpy. GP does not believe that the cost per ton of VOC emission reduction through any vapor recover with add on control are economically feasible. The ranked cost effectiveness of each remaining control technology, is presented below.

- Submerged fill/bottom loading
- Tank color

5.4.5. Step 5 - Select BACT

GP proposes to use submerged fill/bottom loading as BACT for VOC from the gasoline storage tank. GP proposes an emission limit of 21.2 lb/hr.

6. ADDITIONAL IMPACTS, OZONE REVIEW, AND CLASS I AREA REVIEW

6.1. ADDITIONAL IMPACTS

An additional impacts analysis is required under the PSD requirements at ADEM Admin Code r. 335-3-14-.04(14) to evaluate the effects of economic growth and the effect on soils, vegetation, and visibility from regulated compounds emitted in significant quantities from a new or modified major stationary source.

6.1.1. Growth Analysis

The growth analysis evaluates the impact associated with the project on the general commercial, residential, and industrial growth within the project vicinity. PSD requires an assessment of the secondary impacts from applicable projects. Although the Talladega Sawmill will generate jobs, the work force will likely be no greater than the workforce associated with the GP plywood plant which stopped operations in 2008. There will also be some long-term growth (i.e., general commercial, residential, industrial or other secondary growth in the area) expected as a result of the proposed Talladega Sawmill. However, the growth in the area is expected to be gradual. Therefore, no analysis of secondary impacts from associated growth is warranted for this project.

6.1.2. Soils and Vegetation

The PSD regulations require an evaluation of the impact of project emissions on soils and vegetation. The analysis is required only for those pollutants for which PSD review is triggered. According to *A Screening Procedure for the Impacts of Air Pollution on Plants, Soils and Animals*[9], the relevant pollutants for soils and vegetation are NO_2, SO_2, and CO. The project triggers PSD review for VOC only and does not have a significant net emissions increase of NO_2, SO_2, or CO. Therefore, a soils and vegetation analysis is not necessary because no significant impacts are expected.

6.1.3. Class II Area Visibility

The PSD regulations require an evaluation of the impact of project emissions on visibility in Class II areas. The analysis is required only for those pollutants for which PSD review is triggered. The relevant pollutants for visibility are PM, NO_X, and SO_2. The project triggers PSD review for VOC only and does not have a significant net emissions increase of PM, NO_X, and SO_2. Therefore, a visibility analysis is not necessary because no significant impacts are expected.

6.2. OZONE AIR QUALITY REVIEW

An application for a PSD permit must include an analysis of the ambient air quality in the vicinity of the proposed project for each compound for which the project is subject to PSD review. Because the proposed project triggers PSD review for VOC, an ambient impact analysis for ozone is required. In addition, as the emissions of VOC exceed the monitoring *de minimis* level of 100 tpy, an evaluation is

[9] U.S. EPA, "*A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils and Animals,*" December 12, 1980.

required to determine if representative ozone data are available in lieu of pre-construction ozone monitoring. Existing air quality may be used in lieu of pre-constructing monitoring if:

- The data are representative of the proposed facility's impact areas;
- The data are of similar quality as would be obtained if the applicant monitored according to the PSD requirements; and
- The data are current; that is, the data have been collected during the two-year period preceding the permit application, provided the data are still representative of current conditions.

The closest ozone monitor relative to the Talladega Sawmill is approximately 28 miles away, located at 201 Ashville Road in Leeds, Alabama (AQS ID 01-073-1010) as shown in Figure 6-1. Given the proximity to the Talladega Sawmill and the regional nature of background ozone, the Leeds monitor provides a representative indication of ozone concentrations in the vicinity of the Talladega facility. The monitor is operated by ADEM and their *State of Alabama Ambient Air Monitoring 2017 Consolidated Network Review*[10] describes the Leeds monitor as a high population exposure monitor that is currently active and began sampling in 2001. The data is considered of good quality and is suitable for comparison to the O_3 NAAQS. The availability of current, representative monitored ozone data that are of good quality and were collected appropriately precludes the need for additional pre-construction ambient ozone monitoring for the project.

[10] ADEM, *State of Alabama Ambient Air Monitoring 2017 Consolidated Network Review*. http://www.adem.state.al.us/programs/air/airquality/2017AmbientAirPlan.pdf

Figure 6-1. Location of Ozone Monitor relative to the Talladega Sawmill

GP reviewed the current and historical design values[11] for the Leeds monitor, which represents the 3-year average of the 4th highest daily 8-hour concentration, relative to the 2015 ozone NAAQS of 70 parts per billion (ppb). Table 6-1 summarizes these values and demonstrates that the monitor has measured ambient ozone concentrations in attainment with the ozone NAAQS and also indicated a downward trend and improved ozone air quality over the last ten or more years.

[11] EPA tabulated design values, https://www.epa.gov/air-trends/air-quality-design-values.

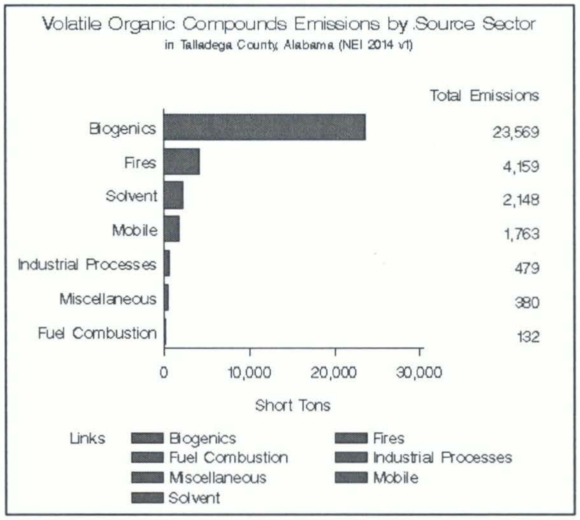
Table 6-1. Summary of Leeds-Talladega Area Ozone Design Values, 2007-2016

Design Value	AQS ID: 01-073-1010 Leeds, AL (201 Ashville Road) (ppb)
2005-2007	75
2006-2008	76
2007-2009	72
2008-2010	69
2009-2011	71
2010-2012	76
2011-2013	74
2012-2014	69
2013-2015	63
2014-2016	64

Ozone is formed by the reaction of sunlight on air containing VOC and NO_X. In the southeastern United States, ozone formation is limited by NO_X emissions due to high amounts of biogenic VOC in the atmosphere. The Talladega Sawmill is located in Talladega County. As noted, the proposed project will have an insignificant increase in NO_X, but the project will have a significant PSD increase in VOC emissions. VOC emissions by source sector in Talladega County were compiled from the U.S. EPA Air Emission Sources database.[12] Figure 6-2 summarizes these emissions and shows that the Talladega Sawmill will increase VOC emissions (878.9 tons) in Talladega County by approximately 2.7% compared to the existing inventory (32,630 tons), a relatively insignificant amount. Because ozone formation is NO_X limited in the southeast, the increase in VOC emissions from the proposed project is not expected to significantly affect ozone concentrations in the vicinity of or downwind of the Talladega Sawmill.

12 https://www.epa.gov/air-emissions-inventories/where-you-live.

Figure 6-2. Summary of Ozone Precursor Emissions (VOC) in Talladega County, Alabama



In December 2016, a final revision to the U.S. EPA's Appendix W, *Guideline on Air Quality Models*, was signed providing more specific guidance for assessing the impacts of an individual source on ozone. As part of the more specific guidance, the U.S. EPA is currently finalizing a two-tiered demonstration approach for addressing individual source impacts on ozone. The first tier involves use of technically credible relationships between precursor emissions and a source's impacts while the second tier involves application of more sophisticated case-specific chemical transport models. The U. S. EPA has recently issued draft guidance providing recommendations on air quality modeling and related technical analyses to satisfy compliance demonstration requirements for ozone for permit-related assessments under the PSD program; *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program* (December 02, 2016) and Errata Memo (February 23, 2017). The draft guidance provides a Tier 1 demonstration tool for ozone (and $PM_{2.5}$) referred to as Modeled Emission Rates for Precursors (MERPs). The MERPs are screening thresholds for precursor emissions, where VOC and NO_X screening values are provided for ozone, that are expected to result in an insignificant increase in ambient ozone relative to the NAAQS; i.e., an impact less than the 8-hour ozone significant impact level (SIL) of 1 ppb. The MERP values were derived based on modeling conducted by U.S. EPA for locations across the U.S. For this project, since PSD analysis is only applicable to VOC, only a comparison against VOC MERPs was conducted.

Table 7.1 of the guidance, as updated in the Errata Memo, provides the "Most Conservative (Lowest) Illustrative MERP Values (tons per year) by Precursor, Pollutant and Region". MERP values are provided for VOC for the central, eastern and western U.S. For the eastern U.S., the VOC value for evaluating 8-hour ozone impacts is 1,159 tpy. To determine if an individual source would exceed the critical air quality threshold, the emissions increase is calculated as a percent of the lowest MERP for each precursor requiring analysis and summed. Using the equation prescribed for this determination of additive secondary impacts on 8-hour daily maximum ozone (see below), the emission increase of 878.9 tpy VOC equates to less than 100 percent and thus shows the critical air quality threshold will not be exceeded and the project would be presumed to have an insignificant impact on ozone concentrations.

(878.9 tpy VOC/1,159 tpy VOC 8-hr daily maximum ozone MERP) = 0.758 = 0.758 x 100% = 76%

Because the significant net emissions increase in VOC emissions from the project is small relative to the existing background emissions inventory, along with emissions being below the critical air quality threshold per the draft U.S. EPA MERP guidance, ozone concentrations in the vicinity of the Talladega Sawmill are not expected to be significantly affected by the proposed project.

6.3. CLASS I AREA IMPACTS

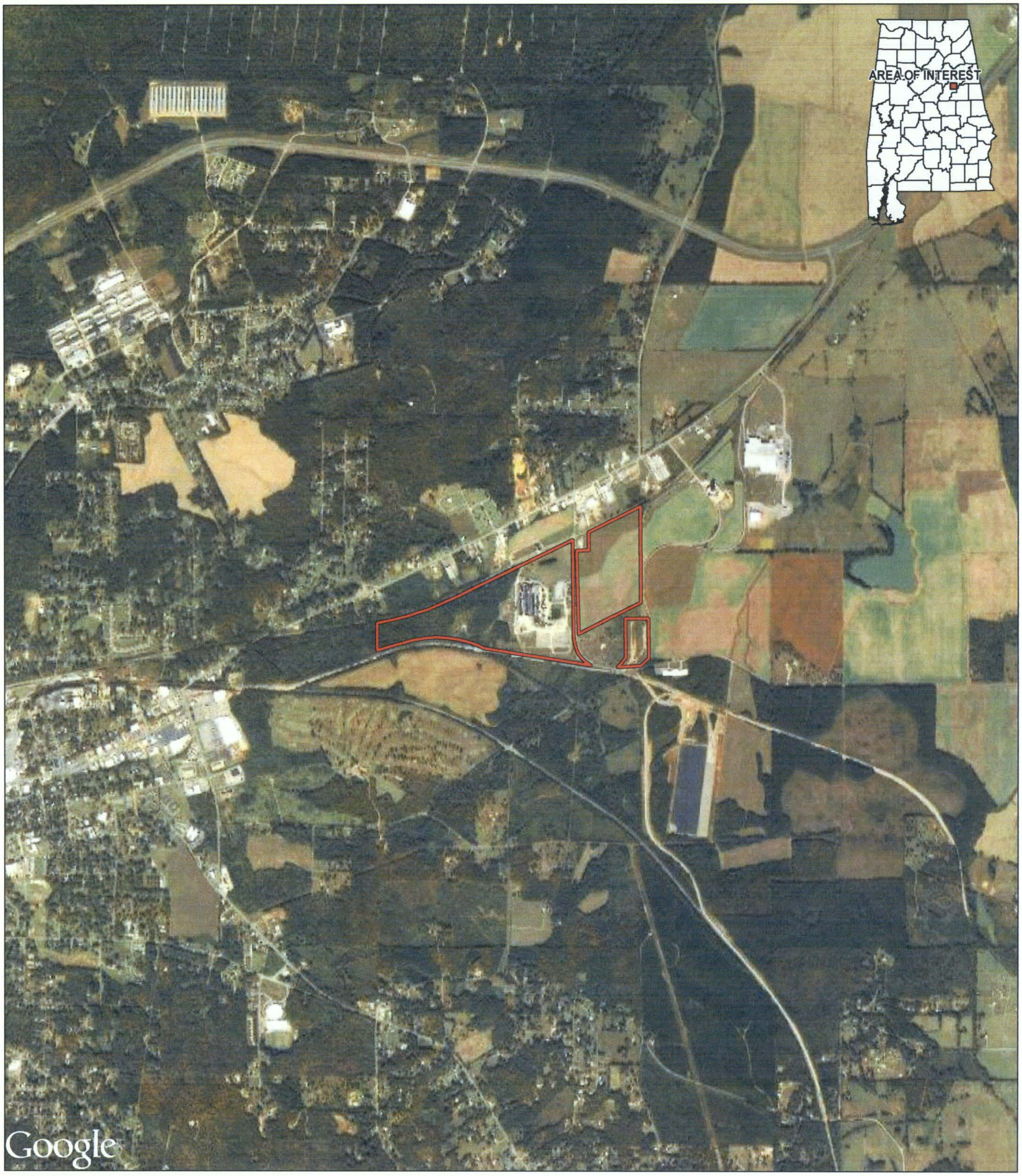
Class I areas are areas of particular value from a natural, scenic, recreational, and/or historical perspective. PSD permitting regulations afford Class I areas additional protection against adverse impacts on PSD increments and air quality related values (e.g., visibility and deposition). U.S. EPA and Federal Land Manager guidance generally requires that sources located within 300 km of one or more Class I areas evaluate whether PSD Class I increments and certain air quality related values be adversely affected. There are five Class I areas located within 300 km of the Talladega Sawmill with approximate distances listed below.

Sipsey Wilderness Area	160 km
Cohotta Wilderness Area	210 km
Joyce Kilmer-Slickrock Wilderness	286 km
Great Smoky Mountains National Park	300 km

The proposed project would cause a significant net emissions increase only of VOC, which is not a visibility- or deposition-affecting pollutant and for which there are no Class I PSD Increment. For this reason and because the project would not cause significant increases of NO_X, SO_2, or PM that may affect visibility or deposition and for which PSD Class I Increments have been established, Class I area impact analyses are not required.

APPENDIX A

FACILITY MAP AND PROCESS FLOW DIAGRAM



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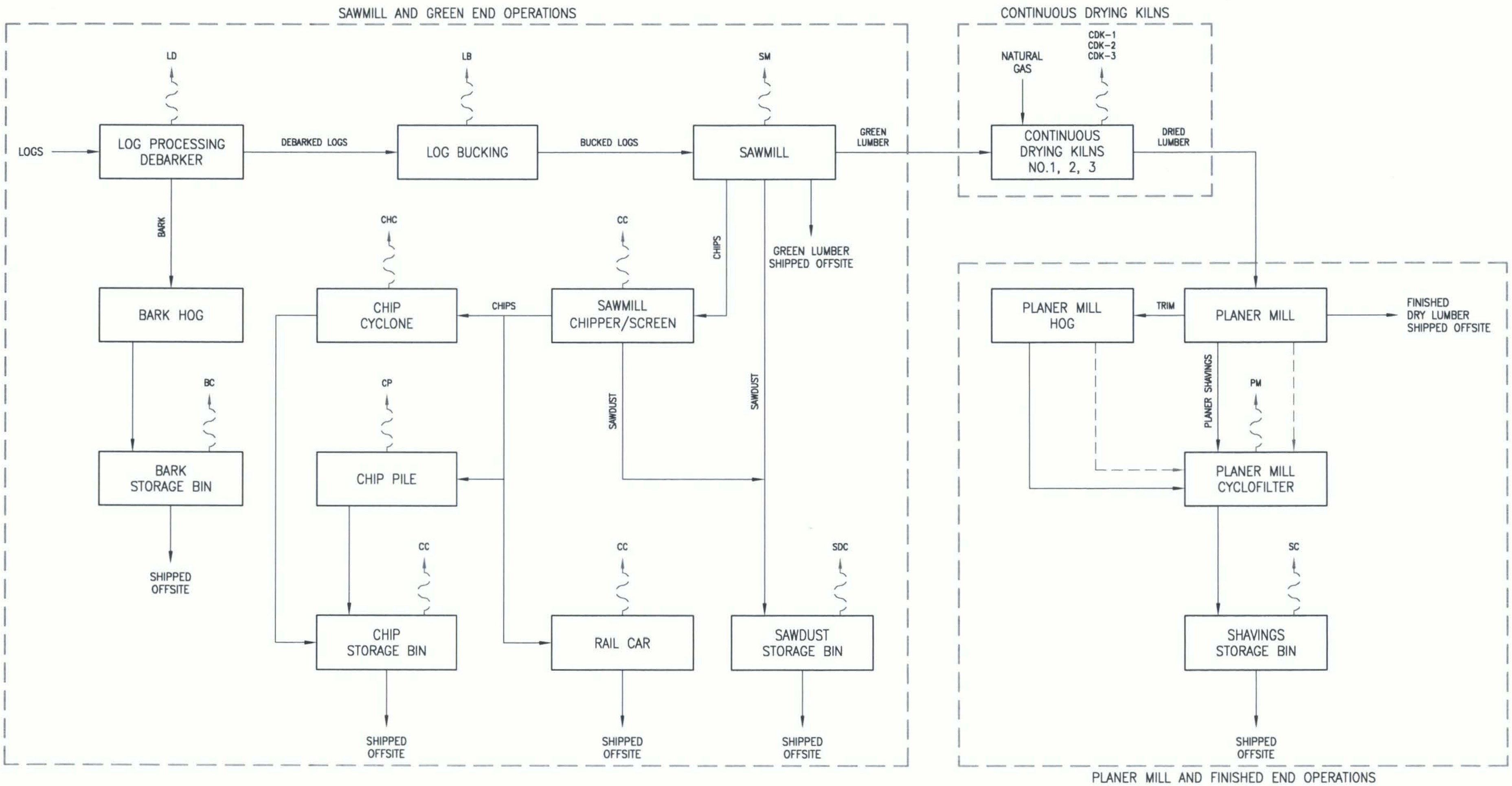
PROPERTY BOUNDARY

2178.000.G1

AREA MAP

GEORGIA-PACIFIC WOOD PRODUCTS, LLC
TALLADEGA, ALABAMA

Approved by:	BMH	GBMc STRATEGIC ENVIRONMENTAL SERVICES 219 Brown Lane Bryant, Arkansas 72022	Project No.:	2178-17-030
Checked by:	BMH		Date:	08/30/2017
Drawn by:	IT		Scale:	SHOWN



LEGEND

MATERIAL/LIQUID

AIR EMISSIONS

NOTE: ANCILLARY & MISCELLANEOUS SOURCES NOT ASSOCIATED WITH PRODUCTION PROCESS ARE NOT SHOWN.

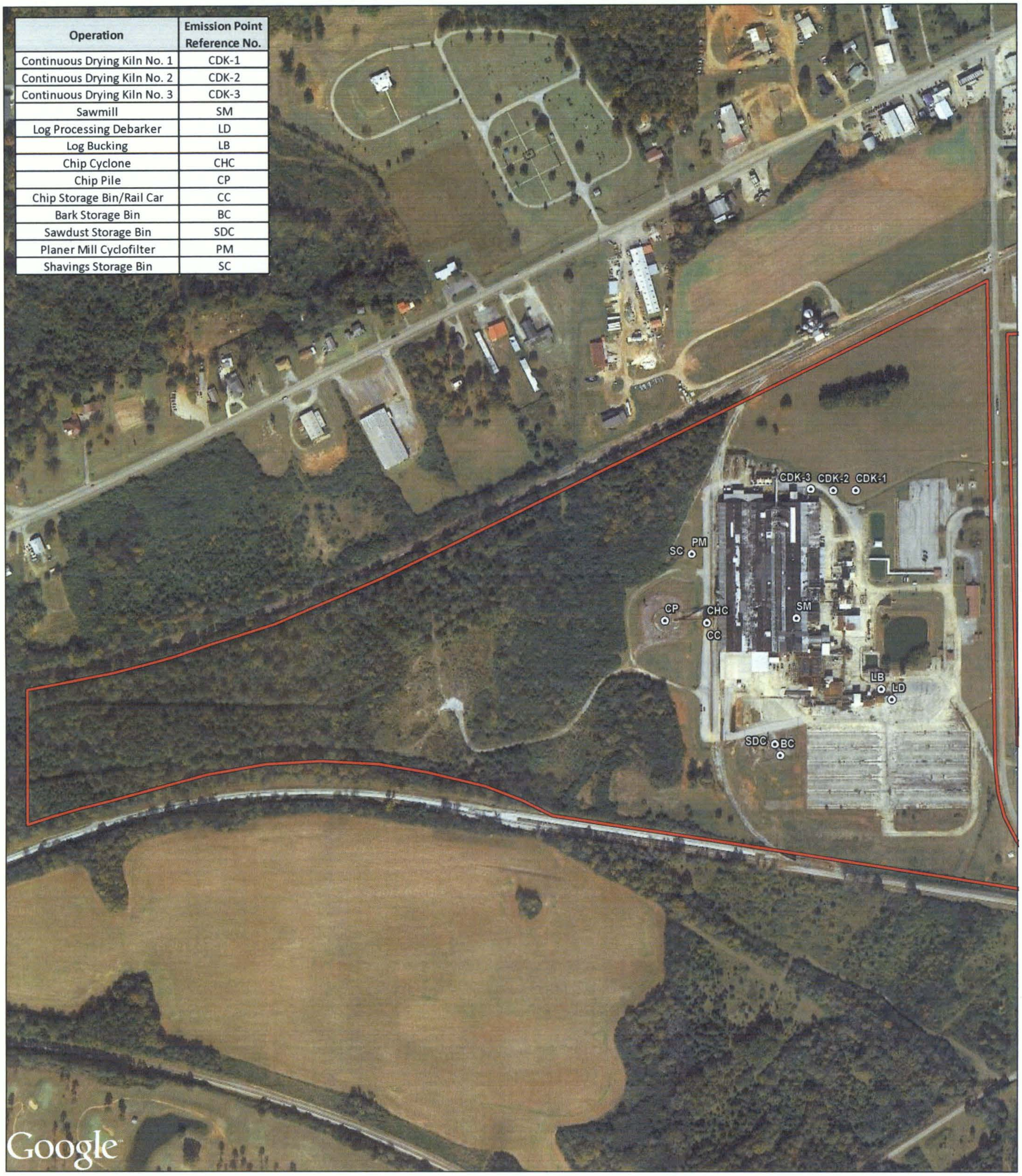
2178.100.G1

PROCESS FLOW DIAGRAM

GEORGIA-PACIFIC WOOD PRODUCTS LLC
TALLADEGA, ALABAMA

Approved by:	LMR	GBMc STRATEGIC ENVIRONMENTAL SERVICES 219 Brown Lane Bryant, AR 72022	Project No.:	2178-17-030
Checked by:	CWR		Date:	08/30/2017
Drawn by:	IT		Scale:	---

Operation	Emission Point Reference No.
Continuous Drying Kiln No. 1	CDK-1
Continuous Drying Kiln No. 2	CDK-2
Continuous Drying Kiln No. 3	CDK-3
Sawmill	SM
Log Processing Debarker	LD
Log Bucking	LB
Chip Cyclone	CHC
Chip Pile	CP
Chip Storage Bin/Rail Car	CC
Bark Storage Bin	BC
Sawdust Storage Bin	SDC
Planer Mill Cyclofilter	PM
Shavings Storage Bin	SC



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FEET

⊙ EMISSION POINT
PROPERTY BOUNDARY

2178.000.G2

PLOT PLAN

GEORGIA-PACIFIC WOOD PRODUCTS, LLC
TALLADEGA, ALABAMA

Approved by:	BMH	GBMc	Project No.:	2178-17-030
Checked by:	BMH	STRATEGIC ENVIRONMENTAL SERVICES	Date:	08/31/2017
Drawn by:	IT	219 Brown Lane Bryant, Arkansas 72022	Scale:	SHOWN

APPENDIX B

EMISSION CALCULATIONS

GP Talladega: Emission Summary

Source Group	Description	Pollutant	Potential Facility-Wide Emissions	
			lb/hr	tpy
Facility Wide	Criteria Pollutant Emissions	PM	19.76	23.75
		PM_{10}	8.77	14.48
		$PM_{2.5}$	4.33	9.49
		SO_2	0.58	0.41
		VOC [1]	314.40	878.87
		CO	10.73	40.10
		Lead	5.39E-05	2.36E-04
		NO_X	14.43	31.19
	HAP Emissions	Acetaldehyde	2.68E+00	8.06E+00
		Acrolein	3.19E-01	9.60E-01
		Arsenic	2.16E-05	9.45E-05
		Benzene	2.33E-03	1.52E-03
		Beryllium	--	--
		Cadmium	1.19E-04	5.20E-04
		Chromium	1.51E-04	6.61E-04
		Cobalt	9.06E-06	3.97E-05
		Dichlorobenzene	1.29E-04	5.67E-04
		Formaldehyde	1.36E+00	4.08E+00
		Hexane	1.94E-01	8.50E-01
		Manganese	4.10E-05	1.79E-04
		Mercury	2.80E-05	1.23E-04
		Methanol	1.33E+01	4.01E+01
		Methyl Isobutyl Ketone	6.38E-02	1.92E-01
		Naphthalene	2.57E-04	3.36E-04
		Nickel	2.26E-04	9.92E-04
		Phenol	6.58E-02	1.98E-01
		POM	3.65E-04	1.14E-04
		Propionaldehyde	6.38E-02	1.92E-01
		Selenium	--	--
		Toluene	7.67E-03	2.10E-02
		Xylene	1.34E-02	3.86E-02
		Highest Single HAP	13.33	40.10
		Total HAP	18.10	54.70
	Air Toxics	Barium	4.75E-04	2.08E-03
		Butane	2.26E-01	9.92E-01
		Copper	9.17E-05	4.02E-04
		Ethane	3.34E-01	1.46E+00
		Molybdenum	1.19E-04	5.20E-04
		Pentane	2.80E-01	1.23E+00
		Propane	1.73E-01	7.56E-01
		Vanadium	2.48E-04	1.09E-03
		Zinc	3.13E-03	1.37E-02
	GHG Emissions	CH4	0.26	1.07
		N2O	0.027	0.11
		GHG	13,310.3	56,784.0
		Total CO2e	13,324.7	56,841.7

Note:

[1] VOC emissions are represented as VOC as WWP1 for the Continuous Drying Kilns, VOC as TOC for the Fire Pump Engine, and VOC as C for the Large Storage Tanks and Storage Tanks < 1,000 gallons.

GP Talladega: Emission Summary (Continued)

Source Group	Description	Pollutant	Potential Source Group Emissions	
			lb/hr	tpy
Sawmill and Green End Operations	Total Source Group (LD, LB, SM, CHC, BC, CC, CP, SDC, RD): Emission Summary	PM	17.92	18.96
		PM_{10}	5.93	6.02
		$PM_{2.5}$	1.50	1.06
Continuous Drying Kilns	Total Source Group (CDK-1, CDK-2, CDK-3): Emission Summary	PM	0.90	2.98
		PM_{10}	1.99	7.11
		$PM_{2.5}$	1.99	7.11
		VOC as C	227.70	684.80
		VOC (WPP1)	292.07	878.40
		SO_2	0.06	0.28
		CO	9.06	39.68
		NO_X	6.68	29.25
		Lead	5.39E-05	2.36E-04
		Acetaldehyde	2.68E+00	8.06E+00
		Acrolein	3.19E-01	9.60E-01
		Arsenic	2.16E-05	9.45E-05
		Barium	4.75E-04	2.08E-03
		Benzene	2.26E-04	9.92E-04
		Beryllium	--	--
		Butane	2.26E-01	9.92E-01
		Cadmium	1.19E-04	5.20E-04
		Chromium	1.51E-04	6.61E-04
		Cobalt	9.06E-06	3.97E-05
		Copper	9.17E-05	4.02E-04
		Dichlorobenzene	1.29E-04	5.67E-04
		Ethane	3.34E-01	1.46E+00
		Formaldehyde	1.35E+00	4.08E+00
		Hexane	1.94E-01	8.50E-01
		Manganese	4.10E-05	1.79E-04
		Mercury	2.80E-05	1.23E-04
		Methanol	1.33E+01	4.01E+01
		Methyl Isobutyl Ketone	6.38E-02	1.92E-01
		Molybdenum	1.19E-04	5.20E-04
		Naphthalene	6.58E-05	2.88E-04
		Nickel	2.26E-04	9.92E-04
		Pentane	2.80E-01	1.23E+00
		Phenol	6.58E-02	1.98E-01
		POM	5.59E-06	2.45E-05
		Propane	1.73E-01	7.56E-01
		Propionaldehyde	6.38E-02	1.92E-01
		Selenium	--	--
		Toluene	6.75E-03	2.08E-02
		Vanadium	2.48E-04	1.09E-03
		Xylene	1.28E-02	3.84E-02
		Zinc	3.13E-03	1.37E-02
		CO2	12,943.2	56,691.1
		CH4	0.24	1.07
		N2O	0.02	0.11
		GHG	12,943.4	56,692.3
		Total CO2e	12,956.5	56,749.7
		Highest Single HAP	1.33E+01	4.01E+01
		Total HAP	1.81E+01	5.47E+01
Planer Mill and Finished End Operations	Total Source Group (PM, SC): Emission Summary	PM	0.39	1.67
		PM_{10}	0.28	1.20
		$PM_{2.5}$	0.27	1.18

GP Talladega: Emission Summary (Continued)

Source Group	Description	Pollutant	Potential Source Group Emissions lb/hr	Potential Source Group Emissions tpy
Fire Pump Engine	Total Source Group (FE): Emission Summary	PM	0.55	0.14
		PM_{10}	0.57	0.14
		$PM_{2.5}$	0.57	0.14
		NO_X	7.75	1.94
		CO	1.67	0.42
		VOC as TOC	0.63	0.16
		SO2	0.51	0.13
		Acetaldehyde	1.73E-03	4.31E-04
		Acrolein	--	--
		Benzene	2.10E-03	5.25E-04
		1,3-Butadiene	--	--
		Formaldehyde	2.66E-03	6.64E-04
		Naphthalene	1.91E-04	4.77E-05
		Toluene	9.20E-04	2.30E-04
		Xylene	6.41E-04	1.60E-04
		POM	3.59E-04	8.98E-05
		CO2	3.67E+02	9.17E+01
		CH4	1.49E-02	3.72E-03
		N2O	2.98E-03	7.44E-04
		GHG	3.67E+02	9.17E+01
		Total CO2e	3.68E+02	9.20E+01
		Highest Single HAP	2.66E-03	6.64E-04
		Total HAP	4.10E-01	2.10E-03
Large Storage Tanks	Total Source Group (LST-1, LST-2, LST-3): Emission Summary	VOC as C	2.14E+01	3.16E-01
Trivial Activities [1]	Total Trivial Tank Group (TST) Emission Summary:	VOC as C	2.58E-01	1.18E-03

Note:

[1] Trivial activity emissions have been included for PSD applicability, however, are not included as proposed permitted sources in accordance with Section 1.E(2) of the TRIVIAL AND INSIGNIFICANT ACTIVITIES list dated September 23, 2009.

GP Talladega: PSD Potential To Emit vs PSD SER Summary

Source Group	NO_x	CO	SO_2[1]	PM[1]	PM_{10}	$PM_{2.5}$	VOC[2]	Lead	CO2e
Sawmill and Green End Operations	--	--	--	19.0	6.0	1.1	--	--	--
Continuous Drying Kilns	29.3	39.7	0.3	3.0	7.1	7.1	878.4	0.0002	56,750
Planer Mill and Finished End Operations	--	--	--	1.7	1.2	1.2	--	--	--
Fire Pump Engine	1.9	0.4	0.1	0.1	0.1	0.1	0.2	--	92
Large Storage Tanks	--	--	--	--	--	--	0.3	--	--
Storage Tanks < 1,000 gallons	--	--	--	--	--	--	0.001	--	--
Total PTE	31.2	40.1	0.4	23.7	14.5	9.5	878.9	0.0002	56,842
New Project Emissions	**31.2**	**40.1**	**0.4**	**23.7**	**14.5**	**9.5**	**878.9**	**0.0002**	**56,842**
PSD SER	40	100	40	25	15	10	40	0.6	75,000
PSD Triggered?	No	No	No	No	No	No	**Yes**	No	No

Notes:

[1] Potential emission calculations are calculated according to design limitations.

[2] VOC emissions are represented as VOC as WWP1 for the Continuous Drying Kilns, VOC as TOC for the Fire Pump Engine, and VOC as C for the Large Storage Tanks and Storage Tanks < 1,000 gallons.

State Regulated Allowable Emissions

State Regulated Allowable PM Emissions Summary Table

Operation	Emission Point Reference No.	Emission Group	Allowable PM[1] (lb/hr)	Allowable PM[1] (tpy)	Requested PM[1] (lb/hr)	Requested PM[1] (tpy)
Log Processing Debarker	LD	Sawmill and Green End Operations	29.33	128.46	0.66	1.35
Log Bucking	LB		14.75	64.62	9.77	0.91
Sawmill	SM		28.44	124.55	0.84	1.71
Chip Conveyance	CC		35.61	155.98	0.58	1.20
Bark Conveyance	BC		29.33	128.46	0.14	0.28
Chip Pile	CP		14.10	61.74	<0.01	<0.01
Sawdust Conveyance	SDC		28.44	124.55	0.13	0.27
Chip Cyclone	CHC		35.61	155.98	0.69	3.00
Haul Roads	RD		49.04	214.80	5.11	10.23
Continuous Drying Kiln No. 1	CDK-1	Continuous Drying Kilns	32.19	141.01	0.33	1.11
Continuous Drying Kiln No. 2	CDK-2		32.19	141.01	0.33	1.11
Continuous Drying Kiln No. 3	CDK-3		30.12	131.94	0.23	0.76
Planer Mill	PM	Planer Mill and Finished End Operations	15.55	68.12	0.37	1.61
Shavings Conveyance	SC		15.55	68.12	0.02	0.06
Total Allowable PTE for PM			**390.26**	**1,709.33**	**19.21**	**23.61**

Notes:

[1] Unrestricted potential to emit emissions calculated in accordance with ADEM Admin. Code r. 335-3-4-.04(5) process weight rule (PWR) would cause a net increase of PM emissions above the PSD SER. Therefore, PM limits are requested as specified in the Requested PM amounts above; emission estimates are explained in detail in the emission calculations included as Appendix B.

[2] The emergency fire pump engine is not subject to the ADEM Admin. Code r. 335-3-4 process weight rule (PWR) particulate matter limits.

State Regulated Allowable Emissions (Cont.)

335-3-4-.04 Process Industries - Allowable Particulate Matter Emissions (E): $E = 3.59P^{0.62}$, when $P < 30$ tons/hr ; $E = 17.31P^{0.16}$, when $P \geq 30$ ton/hr

Operation	Emission Point Reference No.	Production (P) (ton/hr)	Allowable PM PTE (E) (lb/hr)	Allowable PM PTE (tpy)	Comments
Sawmill	SM	28.2	28.44	124.55	Production (P) is assumed to be the potential process weight of sawdust and chip throughput.
Chip Cyclone	CHC	90.8	35.61	155.98	Production (P) is assumed to be the potential process weight of the chip throughput.
Planer Mill	PM	10.6	15.55	68.12	Production (P) is assumed to be the potential process weight of the shavings throughput.
Haul Roads	RD	670.8	49.04	214.80	Production (P) is assumed to be the potential process weight of all products and byproducts hauled on and off site in a year back calculated to an hourly rate based on 4,000 hours of
Shavings Conveyance	SC	10.6	15.55	68.12	Production (P) is assumed to be the potential process weight of the shavings throughput.
Log Processing Debarker	LD	29.6	29.33	128.46	Production (P) is assumed to be the potential process weight of bark throughput.
Log Bucking	LB	9.8	14.75	64.62	Production (P) is assumed to be the potential process weight of sawdust throughput.
Chip Conveyance	CC	90.8	35.61	155.98	Production (P) is assumed to be the potential process weight of the chip throughput.
Chip Pile	CP	9.1	14.10	61.74	Production (P) is assumed to be 10% of the potential process weight of the chip throughput.
Bark Conveyance	BC	29.6	29.33	128.46	Production (P) is assumed to be the potential process weight of the bark throughput.
Sawdust Conveyance	SDC	28.2	28.44	124.55	Production (P) is assumed to be the potential process weight of the sawdust throughput.
Continuous Drying Kiln No. 1	CDK-1	48.3	32.19	141.01	Production (P) calculations are based on wood density = 58 lb/ft3; Lumber (tons) = (MBF/hr) x (1000 BF/1 MBF) x (1 Ft3/12 BF) x (lb/ft3 Wood Density) x (1 ton/2,000 lbs)
Continuous Drying Kiln No. 2	CDK-2	48.3	32.19	141.01	
Continuous Drying Kiln No. 3	CDK-3	31.9	30.12	131.94	

State Regulated Allowable Emissions (Cont.)

335-3-5-.01 Fuel Combustion - Allowable Sulfur Dioxide Emissions (E): E = 4.0H, where H = Heat input in MMBtu/hr

Operation	Emission Point Reference No.	Heat Input (H) (MMBtu/hr)	Allowable SO_2 PTE (E) (lb/MMBtu)	Allowable SO_2 PTE (lb/hr)	Allowable SO_2 PTE (tpy)	Requested SO_2 PTE (lb/hr)	Requested SO_2 PTE (tpy)	Notes
Continuous Drying Kiln No. 1	CDK-1	40.0	4.000	160.00	700.80	0.024	0.10	[1]
Continuous Drying Kiln No. 2	CDK-2	40.0	4.000	160.00	700.80	0.024	0.10	[1]
Continuous Drying Kiln No. 3	CDK-3	30.0	4.000	120.00	525.60	0.018	0.08	[1]
Fire Pump Engine	FE	2.3	4.000	9.00	39.42	0.51	0.13	[1]
Total Allowable PTE for SO_2				**449.000**	**1,966.620**	**0.577**	**0.412**	

Note:

[1] Heat input (H) is based on the equipment design.

GP Talladega: Production Data

Recovery Information:

Material	Conversion	Units
Logs	4.10	ton/MBf
Bark	0.37	ton bark/MBf
Chips	1.135	ton/MBf
Shavings	0.200	ton/MBf
Sawdust	0.352	ton/MBf

Production Information Used for Emission Calculations

Process	Proposed Operations		
	(Hourly Production)	(Annual Production)	Notes
Logs Processed	328 ton/hr	1,351,360 tpy	[1]
Sawmill Operation	298 ton/hr	1,229,408 tpy	[2]
	80 MBf/hr	329,600 MBf/yr	[3][4]
Bark	30 ton/hr	121,952 tpy	[1]
Chips	91 ton/hr	374,096 tpy	[1]
Sawdust	28.2 ton/hr	116,019 tpy	[1]
CDK No. 1 (Natural Gas)	20 MBf/hr	120,000 MBf/yr	[5]
CDK No. 2 (Natural Gas)	20 MBf/hr	120,000 MBf/yr	[5]
CDK No. 3 (Natural Gas)	13.2 MBf/hr	80,000 MBf/yr	[5]
Dry Shavings	10.6 ton/hr	64,000 tpy	[6]

Notes:

[1] Logs, bark, chips, and sawdust production estimated based on recovery factors and sawmill MBf rates.

[2] Tons of debarked logs through the sawmill based on the tons of logs processed minus the tons of bark.

[3] Hourly sawmill average design production rate will be 60 MBf/hr. The peak hour production at 100% will be approximately 80 MBf/hr.

[4] Annual sawmill production rate includes the dry lumber production rate 320,000 MBf/yr and up to an additional 3% production (9,600 MBf/yr) of green lumber.

[5] Hourly production based on kiln design capacity assuming product mix with greatest possible hourly production rate. Annual throughput based on expected product mixture.

[6] Dry Shavings estimated based on recovery factors and the sum of all three CDK production rates.

GP Talladega: Sawmill (Emission Point Reference No. SM)

Log Sawing

Operating Parameters	Sawmill Throughputs	Units	Notes
Annual Debarked Log Throughput	1,229,408	ton log/yr	[1][7]
Max Hourly Debarked Log Throughput	298	ton log/hr	[7]
Max Annual Sawdust Generated	114,190	ton sawdust/yr	[8]
Max Annual Emitted Sawdust	11,419	ton sawdust/yr	[2]
Hourly Sawdust Generated	28.2	ton sawdust/hr	[3]
Hourly Emitted Sawdust	2.82	ton sawdust/hr	[2]

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Pollutant	Emission Factor	Units	Control Efficiency	Potential Emissions		Notes
						lb/hr	tpy	
Sawmill	SM	PM	1	lb/ton sawdust generated	70%	0.84	1.71	[1][4][6]
		PM_{10}	0.36		70%	0.30	0.62	[4][6]
		$PM_{2.5}$	0.11		70%	0.09	0.19	[5][6]

Notes:

[1] PM emission limits are requested based on the annual log throughput and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[2] It is assumed that only 10% of the green sawdust generated could be emitted as particulate at the sawmill since the saws are watered.

[3] Hourly sawdust generated estimated based on recovery factors and the maximum hourly sawmill MBf throughput rate.

[4] PM (TSP)/PM_{10} emission factors per FIRE database for SCC 30700803 for sawdust storage pile handling.

[5] $PM_{2.5}$ ratio of PM per EPA PMCALC database EPA's PMCALC database sawdust handling.

[6] A 70% control efficiency was assumed for the all saws based on partial enclosure of the individual saws and building envelope. The level of control claimed is conservative (as the sawdust generated contains 50% moisture) and consistent with Air Pollution Engineering Manual, 2nd Ed., AWMA, c2000, Ch 15, p. 694.

[7] See Production Data section for details on estimation of maximum throughputs.

[8] See sample calculations below for estimating the maximum annual sawdust generated at the sawmill.

SAMPLE CALCULATIONS

Max Annual Sawdust Generated, Sawmill:

$$\frac{116{,}019 \text{ ton sawdust facility wide}}{\text{yr}} - \frac{1{,}829 \text{ ton sawdust bucking saw}}{\text{yr}} = \frac{114{,}190 \text{ ton sawdust}}{\text{yr}}$$

Hourly PM Emission Rate, Sawmill:

$$\frac{1 \text{ lb PM}}{\text{ton sawdust}} \cdot \frac{3 \text{ ton sawdust}}{\text{hr}} \cdot (1 - 0.7) = \frac{0.84 \text{ lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Sawmill:

$$\frac{1 \text{ lb PM}}{\text{ton sawdust}} \cdot \frac{11{,}419 \text{ ton sawdust}}{\text{yr}} \cdot (1 - 0.7) \cdot \frac{\text{ton}}{2000 \text{ lb}} = \frac{1.71 \text{ ton PM}}{\text{yr}}$$

GP Talladega: Chip Cyclone (Emission Point Reference No. CHC)

Chip Cyclone

Operating Parameters	Throughputs	Units	Notes
Max Hourly Chip Production	90.8	tons chips/hr	[1][4]
Max Cyclone Flow Rate	8,000	CFM	[2]

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Pollutant	Grain Loading Emission	Units	Potential Emissions		Notes
					lb/hr	ton/yr	
Chip Cyclone	CHC	PM (f)	1.00E-02	gr/dscf	0.69	3.00	[3][4]
		PM_{10}	4.97E-03	gr/dscf	0.34	1.49	[3]
		$PM_{2.5}$	6.49E-04	gr/dscf	0.04	0.19	[3]

Notes:

[1] See Production Data section for details on estimation of maximum throughputs.

[2] Cyclone design not finalized. Flow rate is estimated to be between 6,000 and 8,000 cfm. Potential emission rates requested at 8,000 cfm.

[3] Chip loading emission factor for PM based on typical vendor data for green end cyclones. PM_{10} and $PM_{2.5}$ based on testing of similar unit plus a safety factor of 20%.

[4] PM emission limits are requested based on the cyclone flow rate and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Chip Cyclone:

$$\frac{1.00\text{E-}02 \text{ grains}}{\text{dscf}} \times \frac{\text{lb}}{7000 \text{ grains}} \times \frac{8{,}000 \text{ dscf}}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} = \frac{0.69 \text{ lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Chip Cyclone:

$$\frac{0.69 \text{ lb PM}}{\text{hr}} \times \frac{\text{ton}}{2000 \text{ lb}} \times \frac{8{,}760 \text{ hr}}{\text{yr}} = \frac{3.00 \text{ ton PM}}{\text{yr}}$$

GP Talladega: Continuous Drying Kilns (Emission Point Reference Nos. (CDK-1, CDK-2, CDK-3)

Fuel Information

Fuel	btu/scf
Natural Gas	1,020

Kiln Information

Description	Emission Point Reference No.	Hourly Burner Rating (MMBtu/hr)	Hourly Production (MBf/hr)	Annual Burner Rating (MMBtu/yr)	Annual Total Production (MBf/yr)	Notes
Continuous Drying Kiln No. 1	CDK-1	40.0	20.0	350,400	120,000	[1][2][15]
Continuous Drying Kiln No. 2	CDK-2	40.0	20.0	350,400	120,000	[1][2][15]
Continuous Drying Kiln No. 3	CDK-3	30.0	13.2	262,800	80,000	[1][2][15]

Criteria & GHG Air Pollutant Emission Calculations

Pollutant	Emission Factor		Potential Emissions						Notes
			CDK-1		CDK-2		CDK-3		
	lb/MBf	lb/MMscf	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
PM (f)	0.013	1.9	0.33	1.11	0.33	1.11	0.23	0.76	[1][8][9]
PM_{10}	0.022	7.6	0.74	2.63	0.74	2.63	0.51	1.86	[8][9]
$PM_{2.5}$	0.022	7.6	0.74	2.63	0.74	2.63	0.51	1.86	[8][9]
VOC as C	4.28	--	85.60	256.80	85.60	256.80	56.50	171.20	[3]
VOC (WPP1)	5.49	--	109.80	329.40	109.80	329.40	72.47	219.60	[4]
SO_2	--	0.6	0.02	0.10	0.02	0.10	0.02	0.08	[9][16]
CO	--	84	3.29	14.43	3.29	14.43	2.47	10.82	[10]
NO_x	--	61.9	2.43	10.64	2.43	10.64	1.82	7.98	[13]
Lead	--	5.00E-04	1.96E-05	8.59E-05	1.96E-05	8.59E-05	1.47E-05	6.44E-05	[9]
CO_2	--	120,019	4,707	20,615	4,707	20,615	3,530	15,461	[14]
CH_4	--	2.26	0.09	0.39	0.09	0.39	0.07	0.29	[14]
N_2O	--	0.23	0.01	0.04	0.01	0.04	0.01	0.03	[14]
GHG	--	120,021	4,707	20,615	4,707	20,615	3,530	15,462	[14]
Total CO_2e	--	120,142	4,711	20,636	4,711	20,636	3,534	15,477	[14]

GP Talladega: Continuous Drying Kilns (Emission Point Reference Nos. (CDK-1, CDK-2, CDK-3) Continued

Air Pollutant Emission Calculations

Pollutant	Emission Factor		Potential Emissions						Notes
			CDK-1		CDK-2		CDK-3		
	lb/MBf	lb/MMscf	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Acetaldehyde	5.04E-02	--	1.01E+00	3.02E+00	1.01E+00	3.02E+00	6.65E-01	2.02E+00	[6]
Acrolein	6.00E-03	--	1.20E-01	3.60E-01	1.20E-01	3.60E-01	7.92E-02	2.40E-01	[6]
Arsenic	--	2.00E-04	7.84E-06	3.44E-05	7.84E-06	3.44E-05	5.88E-06	2.58E-05	[12]
Benzene	--	2.10E-03	8.24E-05	3.61E-04	8.24E-05	3.61E-04	6.18E-05	2.71E-04	[11]
Beryllium	--	ND	--	--	--	--	--	--	[12]
Cadmium	--	1.10E-03	4.31E-05	1.89E-04	4.31E-05	1.89E-04	3.24E-05	1.42E-04	[12]
Chromium	--	1.40E-03	5.49E-05	2.40E-04	5.49E-05	2.40E-04	4.12E-05	1.80E-04	[12]
Cobalt	--	8.40E-05	3.29E-06	1.44E-05	3.29E-06	1.44E-05	2.47E-06	1.08E-05	[12]
Dichlorobenzene	--	1.20E-03	4.71E-05	2.06E-04	4.71E-05	2.06E-04	3.53E-05	1.55E-04	[11]
Formaldehyde	2.53E-02	7.50E-02	5.08E-01	1.53E+00	5.08E-01	1.53E+00	3.36E-01	1.02E+00	[7][11]
Hexane	--	1.80E+00	7.06E-02	3.09E-01	7.06E-02	3.09E-01	5.29E-02	2.32E-01	[11]
Manganese	--	3.80E-04	1.49E-05	6.53E-05	1.49E-05	6.53E-05	1.12E-05	4.90E-05	[12]
Mercury	--	2.60E-04	1.02E-05	4.47E-05	1.02E-05	4.47E-05	7.65E-06	3.35E-05	[12]
Methanol	2.51E-01	--	5.01E+00	1.50E+01	5.01E+00	1.50E+01	3.31E+00	1.00E+01	[7]
Methyl Isobutyl Ketone	1.20E-03	--	2.40E-02	7.20E-02	2.40E-02	7.20E-02	1.58E-02	4.80E-02	[5]
Naphthalene	--	6.10E-04	2.39E-05	1.05E-04	2.39E-05	1.05E-04	1.79E-05	7.86E-05	[11]
Nickel	--	2.10E-03	8.24E-05	3.61E-04	8.24E-05	3.61E-04	6.18E-05	2.71E-04	[12]
Phenol	1.24E-03	--	2.47E-02	7.42E-02	2.47E-02	7.42E-02	1.63E-02	4.94E-02	[6]
POM	--	5.18E-05	2.03E-06	8.90E-06	2.03E-06	8.90E-06	1.52E-06	6.67E-06	[11]
Propionaldehyde	1.20E-03	--	2.40E-02	7.20E-02	2.40E-02	7.20E-02	1.58E-02	4.80E-02	[6]
Selenium	--	ND	--	--	--	--	--	--	[12]
Toluene	1.20E-04	3.40E-03	2.53E-03	7.78E-03	2.53E-03	7.78E-03	1.68E-03	5.24E-03	[6][11]
Xylene	2.40E-04	--	4.80E-03	1.44E-02	4.80E-03	1.44E-02	3.17E-03	9.60E-03	[6]
Highest Single HAP	--	--	5.01	15.04	5.01	15.04	3.31	10.02	
Total HAP	--	--	6.80	20.50	6.80	20.50	4.49	13.69	
Barium	--	4.40E-03	1.73E-04	7.56E-04	1.73E-04	7.56E-04	1.29E-04	5.67E-04	[12]
Butane	--	2.10E+00	8.24E-02	3.61E-01	8.24E-02	3.61E-01	6.18E-02	2.71E-01	[11]
Copper	--	8.50E-04	3.33E-05	1.46E-04	3.33E-05	1.46E-04	2.50E-05	1.10E-04	[12]
Ethane	--	3.10E+00	1.22E-01	5.32E-01	1.22E-01	5.32E-01	9.12E-02	3.99E-01	[11]
Molybdenum	--	1.10E-03	4.31E-05	1.89E-04	4.31E-05	1.89E-04	3.24E-05	1.42E-04	[12]
Pentane	--	2.60E+00	1.02E-01	4.47E-01	1.02E-01	4.47E-01	7.65E-02	3.35E-01	[11]
Propane	--	1.60E+00	6.27E-02	2.75E-01	6.27E-02	2.75E-01	4.71E-02	2.06E-01	[11]
Vanadium	--	2.30E-03	9.02E-05	3.95E-04	9.02E-05	3.95E-04	6.76E-05	2.96E-04	[12]
Zinc	--	2.90E-02	1.14E-03	4.98E-03	1.14E-03	4.98E-03	8.53E-04	3.74E-03	[12]

GP Talladega: Continuous Drying Kilns (Emission Point Reference Nos. (CDK-1, CDK-2, CDK-3) Continued

Notes:

[1] PM emission limits are requested based on the kiln production rates, burner capacity, and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP. Annual burner rating assumes 8,760 hr per a year.

[2] Hourly production based on kiln design capacity assuming product mix with greatest possible hourly production rate.

[3] VOC as C emission factor based on the average plus one standard deviation from site test data from several facilities: GP - Columbia, GP - McCormick, Bibler Brothers - Russellville, Rex Lumber - Grace Mills.

[4] VOC (WPP1) calculated using the Interim VOC Measurement Protocol for the Wood Products Industry – July 2007.

[5] NCASI TB 845 (2002), Table BB1 Steam FSK Emission factor plus a 20% safety factor.

[6] NCASI Wood Products Electronic Database, Updated February 2013. Emission factor is the median plus 20%.

[7] NCASI Wood Products Electronic Database, Updated February 2013. Emission factor is the median plus 1 standard deviation.

[8] Natural gas drying emissions also include emissions associated with wood drying (indirect-fired kiln emissions on a lb/MBF basis) based on GP Warrenton Title V factors, August 2012. Average plus 2 standard deviations.

[9] Emission factor per AP-42, Section 1.4, Natural Gas Combustion, Table 1.4-2 (7/98).

[10] Emission factor per AP-42, Section 1.4, Natural Gas Combustion, AP-42 Table 1.4-1 (7/98).

[11] Emission factor per AP-42, Section 1.4, Natural Gas Combustion, AP-42 Table 1.4-3 (7/98).

[12] Emission factor per AP-42, Section 1.4, Natural Gas Combustion, AP-42 Table 1.4-4 (7/98).

[13] The NOx emission factor is based on 50 ppm exhaust loading @ 3% O_2. Emission factor calculated using EPA Method 19, Eq. 19.1 and tables 19-1 and 19.2.

[14] GHG Emission factors are from Tables C-1 and C-2 of EPA's Mandatory Reporting Rule for Greenhouse Gases (40 CFR 98). Factors are converted from kg/MMBtu to lb/MMscf using a high heat value of 1,026 btu/scf in accordance with 40 CFR 98.

[15] See Production Data section for details on estimation of maximum throughputs.

[16] SO_2 emission limits are requested based on the kiln production rates, burner capacity, and emission factors in lieu of the ADEM 335-3-5-.01 fuel combustion equation for SO_2. Annual burner rating assumes 8,760 hr per a year.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Continuous Drying Kilns No. 1:

40 MMBtu	MMscf	1.9 lb	+	20 MBF	0.013 lb	=	0.33 lb
hr	1020 MMBtu	MMscf		hr	MBF		hr

Annual PM Emission Rate, Continuous Drying Kilns No. 1:

350,400 MMBtu	MMscf	1.9 lb	ton	+	120,000 MBF	0.013 lb	ton	=	1.11 ton
yr	1020 MMBtu	MMscf	2000 lb		yr	MBF	2000 lb		yr

GP Talladega: Planer Mill Cyclofilter (Emission Point Reference No. PM)

Planer Mill

Operating Parameters	Throughputs	Units	Notes
Max Hourly Shavings Production	10.6	tons shavings/hr	
Max Cyclofilter Flow Rate	70,600	CFM	[2]

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Pollutant	Grain Loading Emission Factor	Units	Potential Emissions		Notes
					lb/hr	ton/yr	
Planer Mill	PM	PM (f)	6.08E-04	gr/dscf	0.37	1.61	[1][2]
		PM_{10}	4.43E-04	gr/dscf	0.27	1.17	[2][3]
		$PM_{2.5}$	4.43E-04	gr/dscf	0.27	1.17	[2][3]

Notes:

[1] PM emission limits are requested based on the cyclofilter flow rate and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[2] Filterable grain loading of PM, PM_{10}, $PM_{2.5}$ based on the mass of material after control of the respective particle sizes from the manufacturer cyclofilter design dust emission calculation model.

[3] Filterable PM_{10} + Condensable PM. Condensable PM based on testing of similar unit. Assumed $PM_{2.5}$ = PM_{10}.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Planer Mill Cyclofilter:

$$\frac{6.08\text{E-}04\ \text{grains}}{\text{dscf}} \times \frac{\text{lb}}{7000\ \text{grains}} \times \frac{70{,}600\ \text{dscf}}{\text{min}} \times \frac{60\ \text{min}}{\text{hr}} = \frac{0.37\ \text{lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Planer Mill Cyclofilter:

$$\frac{0.37\ \text{lb}}{\text{hr}} \times \frac{\text{ton}}{2000\ \text{lb}} \times \frac{8{,}760\ \text{hr}}{\text{yr}} = \frac{1.61\ \text{ton PM}}{\text{yr}}$$

RODRIGUE METAL LTD - Div. Rodair

Revision 00

DUST EMISSION CALCULATIONS FOR A CYCLOFILTER

ESTIMATED

Airflow (CFM)	:	70600
Airflow (Cu.met. / hr)	:	120042
Volume of material (lbs/hr) :		57355
Volume of material (kg/hr) :		26070,45
Max. dust emission level (mg / c.m.) :		5

				% of particles	Collector effic.
Range no. 1:	lower than :	1	microns	0,01	99
Range no. 2:	between the 2 values	1-50	microns	0,09	99,9
Range no. 3:	between the 2 values	50-100	microns	0,9	99,95
Range no. 4:	between the 2 values	100-500	microns	5	99,99
Range no. 5:	between the 2 values	500-1000	microns	12	99,995
Range no. 6:	between the 2 values	1000-5000	microns	17	100
Range no. 7:	larger than :	5000	microns	65	100

Calculs

Volume	% of particles	Efficiency	KG of material
26070,45	0,01	99	0,0260705
26070,45	0,09	99,9	0,0234634
26070,45	0,9	99,95	0,1173170
26070,45	5	99,99	0,130352273
26070,45	12	99,995	0,156422727
26070,45	17	100	0
26070,45	65	100	0

Total of reject : 0,454 kg

Dust reject

Total of reject	Multiplier	(C.M./ hr)			
0,45363	1000000	120042	Dust reject :	3,7789	mg / c.m.
			Dust reject :	0,0017	gr. / dscf

Dust emission before control

Volume	Convert (gr/kg)	(C.M. / hr)			
26070,45	1000	120042	Dust emission before control :	217,18	gr /c.m.

Dust emission after control

Reject	Convert (gr/kg)	(C.M. / hr)			
3,7789	0,000001	120042	Dust emission after control :	0,454	kg / hr

Conclusion:

Airflow	:	70600	CFM
Volume of particles	:	57355	lb / hr
Volume of dust rejected	:	3,7789	mg / c.m.
Emission level before control	:	217,1772	gr/c.m.
Emission level after control	:	0,45363	kg / hr

Max. dust emission level : 5 mg / c.m.; 0,0017 gr. / dscf

Project no :	FS - 12919 - 17	By	:	Daniel Beaupre
Customer :	TALLEDEGA, ALABAMA	Date	:	September,07,2017
Identification :	DUST COLLECTOR model CF - 12.5	Signature	:	

GP Talladega: Haul Road (Emission Point Reference No. RD)

Road Information

Road Segment	Paved/ Unpaved	Length[1] (mi)
A	Paved	0.163
B	Paved	0.041
C	Paved	0.039
D	Paved	0.145
E	Paved	0.137
F	Paved	0.145
G	Paved	0.023
H	Paved	0.075
I	Paved	0.069
J	Paved	0.100
K	Unpaved	0.182
L	Unpaved	0.463

Note:

[1] Route segment lengths based on planned traffic flow and google earth measurements.

Truck Traffic Routes

Truck Material	Route[1]
Shavings	A,B,E,F,G,I,J,K,I,G,F,E,B,A
Chips	A,B,E,F,G,I,J,K,I,G,F,E,B,A
Logs	A,D,E,B,A
Logs (overflow)	A,B,C,L,L,C,B,D,E,B,A
Bark	A,B,E,F,H,G,F,E,B,A
Green Sawdust	A,B,E,F,H,G,F,E,B,A
Finished Lumber	A,B,E,F,H,G,F,E,B,A

Note:

[1] See truck route map for planned traffic flow.

Truck Traffic Details

Truck Material	Material Throughput[5]	Throughput Units	Truck Weight[1] (tons)		Average Truck Weight (tons)	Number of Trucks[2]	Routes Traveled (# = No of trips)											
			Unloaded	Loaded			A	B	C	D	E	F	G	H	I	J	K	L
Shavings	64,000	tpy	15	40	27.5	2,560	2	2			2	2	2		2	1	1	
Chips	374,096	tpy	15	40	27.5	14,964	2	2			2	2	2		2	1	1	
Logs[3]	1,337,846	tpy	15	40	27.5	53,514	2	1		1	1							
Logs (overflow)[3]	13,514	tpy	15	40	27.5	541	2	3	2	1	1							2
Bark	121,952	tpy	15	40	27.5	4,878	2	2			2	2	1	1				
Green Sawdust	116,019	tpy	15	40	27.5	4,641	2	2			2	2	1	1				
Finished Lumber[4]	329,600	MBf/yr	15	40	27.5	16,480	2	2			2	2	1	1				

Notes:

[1] Truck weight based on engineering estimates.

[2] Number trucks based on material throughput divided by haul weight.

[3] Assumes 1% of logs are stored in the overflow storage area.

[4] Lumber trucks based on 20 MBf per truck.

[5] See Production Data section for details on estimation of maximum throughputs.

GP Talladega: Haul Road (Emission Point Reference No. RD) Continued

Notes (continued):

[2] Unpaved route emission factor is based on Equations 1a and 2 of AP-42, Section 13.2.2 (November 2006):

Equations 1a and 2 (combined):

$$E = k \times \left(\frac{s}{12}\right)^a \times \left(\frac{W}{3}\right)^b \times \left(\frac{365 - P}{365}\right)$$

E =		size specific emission factor (lb/VMT)
s =	1.1	average surface material silt content (%), based on testing done at the GP Warrenton Lumber Mill.
W =		mean vehicle weight (tons)
k =	4.9	particle size multiplier, AP-42, Section 13.2.2, Table 13.2.2-2.
	1.5	
	0.15	
a =	0.7	empirical constant (PM), AP-42, Section 13.2.2, Table 13.2.2-2.
	0.9	empirical constant (PM10/PM2.5), AP-42, Section 13.2.2, Table 13.2.2-2.
b =	0.45	empirical constant, AP-42, Section 13.2.2, Table 13.2.2-2.
P =	115	number of days in a year with at least 0.254 mm (0.01 in) of precipitation, AP-42, Section 13.2.2, Figure 13.2.2-1

Air Pollutant Emission Calculations

	Vehicle Miles Traveled [1]	Potential Emissions [2][3]					
		PM		PM_{10}		$PM_{2.5}$	
Road Segment	**Maximum**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**	**(lb/hr)**	**(tpy)**
A	31823.4	1.33	2.66	0.27	0.53	0.07	0.13
B	5870.3	0.25	0.49	0.05	0.10	0.01	0.02
C	42.2	0.00	0.00	0.00	0.00	0.00	0.00
D	7831.7	0.33	0.65	0.07	0.13	0.02	0.03
E	19267.6	0.80	1.61	0.16	0.32	0.04	0.08
F	12578.7	0.53	1.05	0.11	0.21	0.03	0.05
G	1433.7	0.06	0.12	0.01	0.02	0.00	0.01
H	1782.5	0.07	0.15	0.01	0.03	0.00	0.01
I	2402.9	0.10	0.20	0.02	0.04	0.00	0.01
J	1752.4	0.07	0.15	0.01	0.03	0.00	0.01
K	3182.8	1.36	2.72	0.26	0.52	0.03	0.05
L	500.4	0.21	0.43	0.04	0.08	0.00	0.01
Total		**5.11**	**10.23**	**1.01**	**2.01**	**0.20**	**0.41**

Notes:

[1] VMT calculated from segment length times number of trips.

[2] Emissions Calculated from emission factor (lb/VMT) * VMT / 2000 lb/ton.

[3] PM emission limits are requested based on the production rates and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[4] Hourly road calculations are conservatively estimated at annual throughput with 4,000 hours of operation per year.

GP Talladega: Haul Road (Emission Point Reference No. RD) Continued

Truck Route Map

GP Talladega: Emergency Fire Pump Engine (Emission Point Reference No. FE)

Operation	Emission Point Reference No.	Parameter	Value	Units	Notes
Emergency Fire Pump Engine	FE	Max Power	250	bhp	[1]
		Average Brake-Specific Fuel Consumption	9,000	Btu/hp-hr	[2]
		Heat Input Capacity	2.25	MMBtu/hr	[7]
		Annual Hours of Operation	500	hr/yr	

Air Pollutant Emission Calculations

Pollutant	Emission Factor		Potential Emissions		Notes
	lb/hp-hr	lb/MMBtu	lb/hr	ton/yr	
PM (f)	2.20E-03	--	0.55	0.14	[3][7]
PM_{10}	2.20E-03	7.70E-03	0.57	0.14	[3][9]
$PM_{2.5}$	2.20E-03	7.70E-03	0.57	0.14	[3][9]
NOx	3.10E-02	--	7.75	1.94	[3]
CO	6.68E-03	--	1.67	0.42	[3]
VOC as TOC	2.51E-03	--	0.63	0.16	[6]
SO_2	2.05E-03	--	0.51	0.13	[3][8]
Acetaldehyde	--	7.67E-04	1.73E-03	4.31E-04	[4]
Acrolein	--	ND	--	--	[4]
Benzene	--	9.33E-04	2.10E-03	5.25E-04	[4]
1,3-Butadiene	--	ND	--	--	[4]
Formaldehyde	--	1.18E-03	2.66E-03	6.64E-04	[4]
Naphthalene	--	8.48E-05	1.91E-04	4.77E-05	[4]
Toluene	--	4.09E-04	9.20E-04	2.30E-04	[4]
Xylene	--	2.85E-04	6.41E-04	1.60E-04	[4]
POM as Total PAH (includes Naphthalene)	--	1.60E-04	3.59E-04	8.98E-05	[4]
Highest Single HAP	--	--	2.66E-03	6.64E-04	
Total HAPs	--	--	8.40E-03	2.10E-03	[4]
CO_2	--	1.63E+02	366.9	91.72	[5]
CH_4	--	6.61E-03	0.015	3.72E-03	[5]
N_2O	--	1.32E-03	0.003	7.44E-04	[5]
GHG	--	1.63E+02	366.9	91.72	[5]
Total CO2e	--	1.64E+02	368.1	92.03	[5]

Notes:

[1] Engine bhp information from previous Talladega facility/permit No. 309-S002.

[2] Average brake-specific fuel consumption (BSFC) based on estimate used in previous permitting for Talladega facility/permit No. 309-S002.

[3] Emission factor per AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, Table 3.3-1. PM emissions for filterable components are included as all PM is assumed to be less than 1 micron in aerodynamic diameter.

[4] Emission factor per AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, Table 3.3-2.

[5] GHG Emission factors are from Tables C-1 and C-2 of EPA's Mandatory Reporting Rule for Greenhouse Gases (40 CFR 98). Factors are converted from kg/MMBtu to lb/MMBtu.

[6] Selected BACT limit based on TOC factor for exhaust and crankcase within AP-42 Section 3.3 Gasoline And Diesel Industrial Engines, Table 3.3-1.

[7] PM emission limits are requested based on the engine burner capacity and AP-42 emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP. Annual burner rating assumes 8,760 hr per a year.

[8] SO_2 emission limit is requested based on the engine combustion rating and emission factors in lieu of the ADEM 335-3-5-.01 fuel combustion equation for SO_2. Annual combustion rate assumes 500 hr per a year as the source is only used for emergency situation and maintenance.

[9] Condensable PM Emission factor per AP-42, Section 3.4, Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-2.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Emergency Fire Pump Engine:

$$\frac{250\ \text{bhp}}{} \;\Big|\; \frac{2.20\text{E-03 lb}}{\text{bhp}} = \frac{0.55\ \text{lb}}{\text{hr}}$$

Hourly Acetaldehyde Emission Rate, Emergency Fire Pump Engine:

$$\frac{2.25\ \text{MMBtu}}{\text{hr}} \;\Big|\; \frac{7.67\text{E-04 lb}}{\text{MMBtu}} = \frac{1.73\text{E-03 lb}}{\text{hr}}$$

Annual PM Emission Rate, Emergency Fire Pump Engine:

$$\frac{0.55\ \text{lb}}{\text{hr}} \;\Big|\; \frac{500\ \text{hr}}{\text{yr}} \;\Big|\; \frac{\text{ton}}{2000\ \text{lb}} = \frac{0.14\ \text{ton}}{\text{hr}}$$

$$\frac{1.73\text{E-03 lb}}{\text{hr}} \;\Big|\; \frac{500\ \text{hr}}{\text{yr}} \;\Big|\; \frac{\text{ton}}{2000\ \text{lb}} = \frac{4.31\text{E-04 ton}}{\text{hr}}$$

GP Talladega: Chip Pile (Emission Point Reference No. CP)

Operation	Silt Content[1] (s)	No. Dry Days per Year[2] (d)	% time winds >12 mph[3] (f)	Emission Factor[4],[5] (lb/day/acre) PM	PM_{10}	$PM_{2.5}$	Pile Area (acre)
Chip Pile	0.00014	250	3.2	3.60E-05	2.09E-05	6.84E-06	1.0

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Potential Emissions PM[6] lb/hr	PM[6] tpy	PM_{10} lb/hr	PM_{10} tpy	$PM_{2.5}$ lb/hr	$PM_{2.5}$ tpy
Chip Pile	CP	1.50E-06	6.57E-06	8.70E-07	3.81E-06	2.85E-07	1.25E-06

Notes:

[1] NCASI Special Report 15-01 Table 5.20, Average TSP and Silt Content for Chips.

[2] Number of days in a year with at least 0.254 mm (0.01 in) of precipitation, AP-42, Section 13.2.2, *Unpaved Roads*, Figure 13.2.2-

[3] Percent of time wind speed greater than 12 mph calculated from NCDC dataset for Anniston, AL for 2012-2016.

[4] Emissions calculated from NCASI Technical Bulletin 424 (March 1984) Figure 10.

[5] PM_{10} and $PM_{2.5}$ speciation from EPA's "PMCALC" database were used to estimate those quantities. (PM_{10} = 58% and $PM_{2.5}$ = 19%).

[6] PM emission limits are requested based on the estimated pile size and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

SAMPLE CALCULATIONS

Emission Factor:

$$\text{EF (lb/day/acre)} = 1.7 \times \left(\frac{s}{1.5}\right) \times \left(\frac{d}{235}\right) \times \left(\frac{f}{15}\right)$$

$$\frac{1.7 \times 0.00014 \times 250 \times 3.2}{1.5 \times 235 \times 15} = \frac{3.60\text{E-05 lb}}{\text{day-acre}}$$

Hourly PM Emission Rate, Chip Pile:

$$\frac{1.0 \text{ acre} \times 3.60\text{E-05 lb} \times \text{day}}{\text{day-acre} \times 24 \text{ hr}} = \frac{1.50\text{E-06 lb}}{\text{hr}}$$

Annual PM Emission Rate, Chips Conveyance:

$$\frac{1.0 \text{ acre} \times 3.60\text{E-05 lb} \times 365 \text{ day} \times 1 \text{ ton}}{\text{day-acre} \times \text{yr} \times 2000 \text{ lb}} = \frac{6.57\text{E-06 ton}}{\text{hr}}$$

GP Talladega: Drop Points (Emission Point Reference Nos. CC, BC, SDC, and SC)

Drop Point Information

Material	Hourly Throughput (tons/hr)	Annual Throughput (tons/yr)	Moisture Content (%)	No. of Transfer Points	Emission Factor (lb/ton)			Notes
					PM	PM_{10}	$PM_{2.5}$	
Chips	90.8	374,096	4.8	7	9.19E-04	4.35E-04	6.59E-05	[1][2][3][7][8]
Bark	29.6	121,952	4.8	5	9.19E-04	4.35E-04	6.59E-05	[1][2][4][7][8]
Sawdust	28.2	116,019	4.8	5	9.19E-04	4.35E-04	6.59E-05	[1][2][6][7][8]
Shavings	10.6	64,000	4.8	2	9.19E-04	4.35E-04	6.59E-05	[1][2][5][7][8]

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Potential Emissions						Notes
		PM		PM_{10}		$PM_{2.5}$		
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	
Chip Conveyance	CC	5.84E-01	1.20E+00	2.76E-01	5.69E-01	4.19E-02	8.62E-02	[7]
Bark Conveyance	BC	1.36E-01	2.80E-01	6.44E-02	1.33E-01	9.75E-03	2.01E-02	[7]
Sawdust Conveyance	SDC	1.29E-01	2.67E-01	6.12E-02	1.26E-01	9.27E-03	1.91E-02	[7]
Shavings Conveyance	SC	1.96E-02	5.88E-02	9.25E-03	2.78E-02	1.40E-03	4.21E-03	[7]

Notes:

[1] For all materials, moisture content (M) is set equal to the maximum value for which the equation is appropriate. Actual moisture content is higher.

[2] Emission factor per AP-42, Section 13.2.4, Aggregate Handling and Storage Piles, drop equation. Mean wind speed for Birmingham, AL per Comparative Climate Data for the United States through 2015.

[3] Pneumatic chip transfer points consist of only 1 drop at a time from either pneumatic conveyance to chip pile, railcar loadout, or through the cyclone to storage bin. Mechanical conveyance consists of 1 drop from saws, 1 drop from chippers, 1 drop from chip screen, 1 drop point from chip pile to conveyor belt, 1 drop point from conveyor belt to storage bin, and 1 drop from loadout (truck loading).

[4] Bark transfer points consist of: 1 drop from debarker, 1 drop from primary to secondary conveyor, 1 drop from bark hog, 1 drop to storage bin, and 1 drop from loadout (truck loading).

[5] Sawdust transfer points consist of: 1 drop from saws, 1 drop from primary to secondary conveyor, 1 drop from chippers, 1 drop to sawdust bin, and 1 drop from loadout (truck loading).

[6] Shavings transfer points consist of 1 drop from cyclone to storage bin and 1 drop from loadout (truck loading).

[7] PM emission limits are requested based on the production rates and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[8] See Production Data section for details on estimation of maximum throughputs.

GP Talladega: Drop Points (Emission Point Reference Nos. CC, BC, SDC, and SC) Continued

SAMPLE CALCULATIONS

Emission factor for PM:

$$\frac{0.74 \;\Big|\; 0.0032 \;\Big|\; \left(\frac{6.2}{5}\right)^{1.3}}{\left(\frac{4.8}{2}\right)^{1.4}} = \frac{9.19\text{E-04 lb PM}}{\text{ton}}$$

Emission factors calculated from AP-42, Section 13.2.4 Equation 1:

$$E\ (\text{lb/ton}) = k \times 0.0032 \times \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

where:

k: Particle size multiplier	0.74	PM
	0.35	PM_{10}
	0.053	$PM_{2.5}$
U: Mean wind speed	6.2	mph

Hourly PM Emission Rate, Chip Conveyance:

$$\frac{91\text{ ton}}{\text{hr}} \;\Big|\; \frac{9.19\text{E-04 lb PM}}{\text{ton}} \;\Big|\; 7\text{ transfers} = \frac{0.584\text{ lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Chip Conveyance:

$$\frac{374096\text{ ton}}{\text{yr}} \;\Big|\; \frac{9.19\text{E-04 lb PM}}{\text{ton}} \;\Big|\; 7\text{ transfers} \;\Big|\; \frac{1\text{ ton}}{2000\text{ lb}} = \frac{1.204\text{ ton PM}}{\text{hr}}$$

GP Talladega: Large Storage Tanks (Emission Point Reference No. LST-1, LST-2, LST-3)

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Tank Size AST (gal)	Tank Dimensions (Diameter (ft) X Height (ft))	TANKS Report Emissions (lb/yr)	Potential Emissions		Notes
					Hourly VOC Emissions (lb/hr)	Annual VOC Emissions (tpy)	
Fuel Station Gasoline Tank	LST-1	2,000	5 x 12	628.36	21.18	3.14E-01	[1][2][5]
Fuel Station Diesel Tank	LST-2	6,000	8 x 16	2.66	0.14	1.33E-03	[2][3][5]
Lubrication Building Hydraulic Tank	LST-3	6,000	8 x 16	1.3	0.14	6.50E-04	[2][4][5]
Large Storage Tanks Emission Total:					21.45	0.32	

Notes:

[1] Potential emission calculations assumes 1,690 gallon/month fuel usage. It is conservatively estimated there are 12 turnover per year for working loss as well as constant breathing loss.

[2] Hourly emissions were estimated using working loss and the assumption of 1 working hr per turnover. See TANKS 4.09d reports for more details.

[3] Potential emission calculations assumes 5,828 gallon/month fuel usage. It is conservatively estimated there are 12 turnover per year for working loss as well as constant breathing loss. Diesel fuel used onsite is assumed to be distillate fuel oil no. 2.

[4] Potential emission calculations assumes 5,828 gallon/month hydraulic fluid throughput. It is conservatively estimated there are 2 turnover per year for working loss as well as constant breathing loss.

[5] The emissions are estimated by EPA TANKS 4.0.9d program. See TANKS 4.0d reports for more details.

GP Talladega: Log Processing Debarker (Insignificant Activity, Emission Point Reference No. LD)

Log Debarking Information

Operation	Emission Point Reference No.	Operating Parameters	Throughputs	Units	Notes
Debarker	LD	Max Annual Log Throughput	1,351,360	ton log/yr	[1][4]
		Max Hourly Log Throughput	328	ton log/hr	[4]

Air Pollutant Emission Calculations

Operation	Pollutant	Emission Factor	Units	Control Efficiency	Potential Emissions lb/hr	Potential Emissions ton/yr	Notes
Debarker	PM	2.00E-02	lb/ ton of logs	90%	0.66	1.35	[1][2]
	PM_{10}	1.10E-02	lb/ ton of logs	90%	0.36	0.74	[2]
	$PM_{2.5}$	6.75E-05	lb/ ton of logs	0%	0.02	0.05	[3]

Notes:

[1] PM emission limits are requested based on the log throughput and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[2] Debarker PM and PM_{10} emission factors from EPA FIRE database, SCC 30700801 (Log Debarking). Applied a 90% control factor for enclosure around debarker.

[3] Debarker $PM_{2.5}$ emission rate based on information from NCASI July 2014 memo for $PM_{2.5}$ Emissions from Drum Debarking. Emission factor presented was 4.5 E-05 lb/ton log processed. Emissions from drum debarker are already considered controlled due to enclosed nature, so no additional controls taken. As data are based on limited testing, a 50% safety factor was used.

[4] See Production Data section for details on estimation of maximum throughputs.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Log Debarking:

$$\frac{328 \text{ ton logs}}{\text{hr}} \times \frac{2.00\text{E-02 lb}}{\text{ton logs}} \times (1 - 0.9 \text{ control}) = \frac{0.66 \text{ lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Log Debarking:

$$\frac{1{,}351{,}360 \text{ ton logs}}{\text{yr}} \times \frac{2.00\text{E-02 lb}}{\text{ton logs}} \times (1 - 0.9 \text{ control}) \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{1.35 \text{ ton PM}}{\text{yr}}$$

GP Talladega: Log Bucking (Insignificant Activity, Emission Point Reference No. LB)

Log Sawing Information:

Operating Parameters	Sawmill Throughputs	Units	Notes
Max Annual Log Throughput	1,229,408	ton log/yr	[1][7]
Max Hourly Log Throughput	328	ton log/hr	[7]
Average Raw Log Stem Length	42	ft/log	[2]
Max Raw Log Stem Length	65	ft/log	[2]
Annual Avg. Raw Log Stem Diameter	1.0	ft	[2]
Hourly Max Raw Log Stem Diameter	1.8	ft	[2]
Annual No. of Log Stems	1,146,763	log stems/yr	[3]
Max No. of Log Stems per Hour	600	logs stems/hr	[2]
Average Log Density	65.0	lb/ft^3	[2]
Max Number of Cuts / Stem	5.0	cuts/stem	[2]
Annual Average Number of Cuts / Stem	1.5	cuts/stem	[8]
Max Kerf per cut	0.5	inches	[4]
Max Annual Sawdust Generated	1,829.5	tpy	[3]
Max Hourly Sawdust Generated	9.8	tph	[3]

Air Pollutant Emission Calculations

Operation	Emission Point Reference No.	Pollutant	Emission Factor	Units	Potential Emissions lb/hr	Potential Emissions tpy	Notes
Log Bucking	LB	PM	1	lb/ton sawdust generated	9.77	0.91	[1][5]
		PM_{10}	0.36		3.52	0.33	[5]
		$PM_{2.5}$	0.11		1.07	0.10	[6]

Notes:

[1] PM emission limits are requested based on the log throughput and emission factors in lieu of the ADEM 335-3-4-.04 process weight rule (PWR) equation that applies to TSP.

[2] Based on design proposal stem handling system/ bucking saw design data.

[3] Sawdust calculated from No. logs * No. cuts * log area (ft^2) * kerf width (ft) * density (lb/ft^3)/2000. Annual calculation makes use of average cuts/stem while hourly calculation makes use of max cuts/stem.

[4] Final design of bucking saw has not been selected. Saw kerf per cut based on maximum kerf for similar facilities (GP Gurdon, GP Warrenton, and GP Sterling).

[5] PM (TSP)/PM_{10} emission factors per FIRE database for SCC 30700803 for sawdust storage pile handling.

[6] $PM_{2.5}$ ratio of PM per EPA PMCALC database EPA's PMCALC database sawdust handling.

[7] See Production Data section for details on estimation of maximum throughputs.

[8] Based on operating information provided by the facility.

SAMPLE CALCULATIONS

Hourly PM Emission Rate, Sawmill:

$$\frac{1\ \text{lb}}{\text{ton sawdust}} \times \frac{9.8\ \text{ton sawdust}}{\text{hr}} = \frac{9.77\ \text{lb PM}}{\text{hr}}$$

Annual PM Emission Rate, Sawmill:

$$\frac{1\ \text{lb}}{\text{ton sawdust}} \times \frac{1{,}829\ \text{ton sawdust}}{\text{yr}} \times \frac{\text{ton}}{2{,}000\ \text{lb}} = \frac{0.91\ \text{ton PM}}{\text{yr}}$$

GP Talladega: Storage Tanks < 1,000 gallons (Trivial Activities, Emission Point Reference No. TST)

Air Pollutant Emission Calculations

Operation	Source Category	Tank Dimensions (Diameter (ft) X Length (ft))	Tank Size (gal)	TANKS Report Emissions (lb/yr)	Potential Emissions Hourly VOC Emissions (lb/hr)	Potential Emissions Annual VOC Emissions (tpy)	Notes
Fire Pump Diesel Tank	Trivial	2.5 x 6	250	0.14	5.83E-03	7.00E-05	[1][2][3][8]
Mobile Shop Motor Oil Tank 1	Trivial	3.5 x 7	450	0.23	1.00E-02	1.15E-04	[2][3][4][8]
Mobile Shop Motor Oil Tank 2	Trivial	3.5 x 7	450	0.23	1.00E-02	1.15E-04	[2][3][4][8]
Mobile Shop Motor Oil Tank 3	Trivial	3.5 x 12	900	0.43	2.08E-02	2.15E-04	[2][3][4][8]
Mobile Shop Hydraulic Tank	Trivial	3 x 5	280	0.13	8.00E-02	6.50E-05	[2][3][5][8]
Mobile Shop Transmission Oil	Trivial	3 x 5	280	0.13	8.00E-02	6.50E-05	[2][3][6][8]
Mobile Shop Used Oil Tank	Trivial	3.5 x 12	900	0.43	2.08E-02	2.15E-04	[2][3][7][8]
Wet Deck Pond Skimmer Used Oil Tank	Trivial	4 x 8	800	0.38	1.83E-02	1.90E-04	[2][3][7][8]
Lubrication Building Small Hydraulic Tank	Trivial	3.5 x 8	500	0.26	1.17E-02	1.30E-04	[2][3][6][8]
Trivial Small Tank Emission Total:					2.58E-01	1.18E-03	

Notes:

[1] Diesel fuel used onsite is has been modeled as distillate fuel oil no. 2.

[2] Hourly emissions were estimated using working loss and the assumption of 1 working hr per turnover.

[3] A maximum of 12 turnovers per year have been assumed for working loss as well as constant breathing loss.

[4] Motor oil was conservatively modeled as distillate fuel oil no. 2.

[5] Hydraulic fluid was conservatively modeled as distillate fuel oil no. 2.

[6] Transmission oil was conservatively modeled as distillate fuel oil no. 2.

[7] Used oil was conservatively modeled as distillate fuel oil no. 2.

[8] The emissions are estimated by EPA TANKS 4.0.9d program. See TANKS 4.0d reports for more details.

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FSDT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Vertical Fixed Roof Tank
Description:	Fuel Station Diesel Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	8.00
Liquid Height (ft) :	15.50
Avg. Liquid Height (ft):	8.00
Volume (gallons):	5,828.20
Turnovers:	12.00
Net Throughput(gal/yr):	69,938.45
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.50
Radius (ft) (Dome Roof)	8.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FSDT - Vertical Fixed Roof Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FSDT - Vertical Fixed Roof Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	1.63	1.03	2.66

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FSGT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Vertical Fixed Roof Tank
Description:	Fuel Station Gasoline Tank

Tank Dimensions

Shell Height (ft):	12.00
Diameter (ft):	5.00
Liquid Height (ft) :	11.50
Avg. Liquid Height (ft):	6.00
Volume (gallons):	1,689.12
Turnovers:	12.00
Net Throughput(gal/yr):	20,269.46
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.50
Radius (ft) (Dome Roof)	5.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FSGT - Vertical Fixed Roof Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 15.0)	All	64.09	58.43	69.75	62.20	8.7758	7.9171	9.7063	60.0000			92.00	Option 4: RVP=15, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FSGT - Vertical Fixed Roof Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 15.0)	254.11	374.25	628.36

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	LBHT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lubrication Building Hydraulic Tank

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	8.00
Liquid Height (ft) :	15.50
Avg. Liquid Height (ft):	8.00
Volume (gallons):	5,828.20
Turnovers:	2.00
Net Throughput(gal/yr):	11,656.41
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	0.50
Radius (ft) (Dome Roof)	8.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

LBHT - Vertical Fixed Roof Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

LBHT - Vertical Fixed Roof Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.27	1.03	1.30

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	FPDT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Fire Pump Diesel Tank

Tank Dimensions

Shell Length (ft):	6.00
Diameter (ft):	3.00
Volume (gallons):	250.00
Turnovers:	12.00
Net Throughput(gal/yr):	3,000.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

FPDT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

FPDT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.07	0.07	0.14

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MSHT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Mobile Shop Hydraulic Tank

Tank Dimensions

Shell Length (ft):	5.00
Diameter (ft):	3.00
Volume (gallons):	280.00
Turnovers:	12.00
Net Throughput(gal/yr):	3,360.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

MSHT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

MSHT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.08	0.06	0.13

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MSMOT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Mobile Shop Motor Oil Tank - 900 gallon

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	3.50
Volume (gallons):	900.00
Turnovers:	12.00
Net Throughput(gal/yr):	10,800.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

MSMOT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

MSMOT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.25	0.18	0.43

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MSMOT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Mobile Shop Motor Oil Tank

Tank Dimensions

Shell Length (ft):		7.00
Diameter (ft):		3.50
Volume (gallons):		450.00
Turnovers:		12.00
Net Throughput(gal/yr):		5,400.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

MSMOT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

MSMOT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.13	0.11	0.23

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	WDPSUOT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Wet Deck Pond Skimmer Used Oil Tank

Tank Dimensions

Shell Length (ft):		8.00
Diameter (ft):		4.00
Volume (gallons):		800.00
Turnovers:		12.00
Net Throughput(gal/yr):		9,600.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

WDPSUOT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

WDPSUOT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.22	0.16	0.38

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	LBSHT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Lubrication Building Small Hydraulic Tank

Tank Dimensions

Shell Length (ft):		8.00
Diameter (ft):		3.50
Volume (gallons):		500.00
Turnovers:		12.00
Net Throughput(gal/yr):		6,000.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

LBSHT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

LBSHT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.14	0.12	0.26

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MSTOT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Mobile Shop Transmission Oil Tank

Tank Dimensions

Shell Length (ft):		5.00
Diameter (ft):		3.00
Volume (gallons):		280.00
Turnovers:		12.00
Net Throughput(gal/yr):		3,360.00
Is Tank Heated (y/n):	N	
Is Tank Underground (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

MSTOT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

MSTOT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.08	0.06	0.13

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	MSUOT
City:	Talladega
State:	Alabama
Company:	Georgia-Pacific
Type of Tank:	Horizontal Tank
Description:	Mobile Shop Used Oil Tank

Tank Dimensions

Shell Length (ft):	12.00
Diameter (ft):	3.50
Volume (gallons):	900.00
Turnovers:	12.00
Net Throughput(gal/yr):	10,800.00
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Birmingham, Alabama (Avg Atmospheric Pressure = 14.44 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

MSUOT - Horizontal Tank
Talladega, Alabama

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	64.09	58.43	69.75	62.20	0.0075	0.0062	0.0089	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

MSUOT - Horizontal Tank
Talladega, Alabama

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	0.25	0.18	0.43

APPENDIX C

BACT SUPPORTING DOCUMENTATION

Table C-1. Emission Unit Subject to BACT

Unit	Max. Throughput Capacity
CDK No 1	20 MBf/hr 120 MMBf/yr 40 MMBtu/hr
CDK No 2	20 MBf/hr 120 MMBf/yr 40 MMBtu/hr
CDK No 3	13.2 MBf/hr 80 MMBf/yr 30 MMBtu/hr
CDK No 2 and 3	33.2 MBf/hr 200 MMBF/yr 70 MMBtu/hr

Table C-2. Potential Control Scenario Summary

Emission Unit	Pollutant	Control Basis	Current Potential Emissions (VOC as WWP1) [1]	Current Potential Emissions (VOC as C)	Capture Efficiency [2]
CDK No 1	VOC	RTO	5.49 lb/MBF	4.28 lb/MBF	80.0%
CDK No 2 and 3	VOC	RTO	5.49 lb/MBF	4.28 lb/MBF	80.0%

Table C-2 Notes:

1. Engineering estimate based design characteristics of continuous kiln.
2. VOC (WPP1) calculated using the Interim VOC Measurement Protocol for the Wood Products Industry – July 2007.

Table C-3. Cost Summary

Emission Unit	Capture Efficiency (%)	Technology	Control Efficiency [1] (%)	Pollutant	Potential Emissions (tpy)	Pollutant Removed (tpy)	Cost Effectiveness ($/ton removed)
CDK No 1	80.0%	RTO	95%	VOC as WPP1	329.40	250.34	$ 9,591
				VOC as C	256.80	195.17	$ 12,303
CDK No 2 and 3	80.0%	RTO	95%	VOC as WPP1	549.00	417.24	$ 9,466
				VOC as C	428.00	325.28	$ 12,142

Table C-3 Notes:

1. RTO control efficiency per Air Pollution Control Technology Fact Sheet - EPA-452/F-03-021. Higher RTO VOC control values have been demonstrated for some applications, but high control is not expected for low concentration high flow applications like those at the CDKs.

Table C-4. Cost Analysis Supporting Information for CDK 1 WESP

Parameter	CDK	Units	Note(s)
Maximum Production Capacity	120	MMBf/yr	1
Airflow Capture Efficiency	80	%	1
PM Control Efficiency	95	%	2
Airflow	40,000	acfm	1
Pressure Drop	1.50	inches of H_2O	3
Fan Motor Efficiency	55	%	4
Fan Electricity Usage	52.0	kW-hr	5
Water Requirement	2.7	gal/min	3
	160	gal/hr	
Water Consumption Cost	0.0053	$/gal	6
Cost to Treat Water	0.375	$/1000 gal	6
Solid Material to be Disposed (PM Collected)	0.84	ton/yr	7
Landfill Fees	320	$/ton	6
Operating Labor Cost	18.2	$/hr	6
Maintenance Labor Cost	26.0	$/hr	6
Electricity Cost	0.06	$/kW-hr	6
WESP Equipment Life	20	years	8
Interest Rate	7%	%	8
January 2017 Chemical Engineering Index	553.1	n/a	9
June 2017 Chemical Engineering Index	567.1	n/a	9

Table C-4 Notes:

1. Engineering estimate based on design characteristics of a continuous lumber kiln.
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 3.14 (highest efficiency value),Page 3-41 of Section 6(Particulate Matter Controls), Chapter 3 (Electrostatic Precipitators).
3. Based on vendor discussions for previous installations.
4. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Page 2-41 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators). Fan efficiency vary from 40 to 70%. Average value of 55% was chosen
5. Per WESP Vendor quote, B&W MEGTEC, January 13, 2017.
6. Based on cost data from similar facility.
7. PM Collected = (PM (filt))*% Capture * 95% Control on captured PM
8. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Page 3-50 of Section 6 (Particulate Matter Controls), Chapter 2 (Electrostatic Precipitators). The typical equipment life of 20 years chosen.
9. Chemical Engineering Index

Table C-5. Capital Cost Evaluation for Wet ESP for the CDK 1

Capital Cost	CDK	OAQPS Notation[1]
Purchased Equipment Costs		
Total Equipment Cost[2]	1,797,372	A
Instrumentation[2]	---	
Freight	89,869	0.05 × A
Total Purchased Equipment Costs	*1,887,240*	B
Direct Installation Costs		
Foundations and Supports	75,490	0.04 × B
Handling and Erection	943,620	0.50 × B
Electrical	150,979	0.08 × B
Piping	18,872	0.01 × B
Insulation	37,745	0.02 × B
Painting	37,745	0.02 × B
Total Direct Installation Costs	*1,264,451*	*C*
Indirect Installation Costs		
Engineering[2]	---	---
Construction and Field Expense	377,448	0.20 × B
Contractor Fees	188,724	0.10 × B
Start-up	18,872	0.01 × B
Performance Test	18,872	0.01 × B
Process Contingencies	56,617	0.03 × B
Total Indirect Installation Costs	*660,534*	*D*
Total Capital Investment ($)	**3,812,225**	**TCI = B + C + D**

Table C-5 Notes:

1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 3.16,Page 3-46 of Section 6 (Particulate Matter Controls), Chapter 3 (Electrostatic Precipitators).

2. Capital Costs are based the budgetary quote from B&W for a SonicKleen WESP (the pricing is for design, engineering and supply of equipment, drawings and flow sheets). Quote provided January 2017.

B&W Cost Estimate for 40,000 acfm flow	**$1,753,000**
January 2017 Chemical Engineering Index	553.1
June 2017 Chemical Engineering Index	567.1
Ratio of indices	1.03
Cost for airflow at design acfm CDK	$1,797,372

Table C-6. Annualized Cost Evaluation for Wet ESP for the CDK 1

Operating Cost	CDK	
Direct Annual Costs, $ [1]		
Operating Labor (0.5-hr/day, 365 days/yr) [3]	3,312	E
Supervisory Labor	497	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	14,251	G
Maintenance Materials	14,251	H = G
Electricity	27,331	I
Water	7,428	J
Water Treatment	526	J
Waste Disposal (solid material)	270	J
Total Direct Annual Costs, $	*67,867*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs, $ [1]		
Overhead	19,387	K = 0.60 × (E + F + G + H)
Administrative Charges	76,245	L = 0.02 × TCI
Property Tax	38,122	M = 0.01 × TCI
Insurance	38,122	N = 0.01 × TCI
Capital Recovery Factor (CRF) [2]	0.0944	Based on 7% interest rate and 20 yr control equip. life
Capital Recovery	359,847	O = CRF*TCI
Total Indirect Annual Costs, $	*531,723*	*IDAC = K + L + M + N + O*
Total Annual Cost, $	**599,590**	*TAC = DAC + IDAC*

Table C-6 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Equation 2.8a, Page 2-21 of Section 1, Chapter 2
3. Based on operating experience at GP's OSB Plants

Table C-7. Cost Analysis Supporting Information for CDK 1 RTO

Parameter	CDKs	Units	Note(s)
Maximum Production Capacity	120	MMBf/yr	1
Uncontrolled Stack Inlet Emissions (VOC as WPP1)	329.40	tpy	2
Uncontrolled Stack Inlet Emissions (VOC as C)	256.80	tpy	2
Airflow Capture Efficiency	80	%	1
Removal Efficiency	95	%	3
VOC as WPP1 Removed	250.34	tpy	4
VOC as C Removed	195.17	tpy	4
Combustion Chamber Temperature (°F)	1600	° F	5
Airflow at stack conditions	40,000	acfm	1
Electricity Usage	120.0	kW-hr	6
Energy Required From Fuel	41,820	MMBtu/yr	6
Operating Labor Cost	18.2	$/hr	7
Maintenance Labor Cost	26.0	$/hr	7
Electricity Cost	0.060	$/kW-hr	7
Natural Gas	4.0	$/mmbtu	7
RTO Equipment Life	20	years	8
Interest Rate	7%		8
February 2007 Chemical Engineering Index	525.4	n/a	
2015 Chemical Engineering Index	556.8	n/a	
January 2017 Chemical Engineering Index	553.1	n/a	
June 2017 Chemical Engineering Index	567.1	n/a	

Table C-7 Notes:

1. Engineering estimate based on design characteristics of a continuous lumber kiln.

2. Potential inlet emissions based on maximum capacity and emission factor of 5.49 lb/MBf (VOC as WPP1) or 4.28 lb/MBf (VOC as C).

3. RTO control efficiency per Air Pollution Control Technology Fact Sheet - EPA-452/F-03-021. Higher RTO VOC control values have been demonstrated for some applications, but high control is not expected for low concentration high flow applications like those at the CDKs.

4. VOC Removed (tpy) = Capture efficiency (%) * Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy).

5. Based on design specifications for similar unit. Assumes 1,600 °F combustion chamber temperature and 200 °F exhaust temperature

6. Per RTO Vendor quote, B&W MEGTEC, January 13, 2017.

7. Based on cost data from similar facility.

8. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), (Incinerators). Equipment life of 20 years chosen in lieu of 10 years for conservatism

Table C-8. Cost Evaluation for CDK 1 RTO

	Capital Cost	CDKs	OAQPS Notation[1]
Purchased Equipment Costs			
	Total RTO Equipment Cost[2]	920,525	A
	Duct Fire Protection ($350/ft)[3]	113,750	
Total Purchased Equipment Costs		*1,034,275*	B
Direct Installation Costs			
	Foundations and Supports	0.08 B	
	Handling and Erection	0.14 B	
	Electrical	0.04 B	
	Insulation	0.01 B	
	Painting	0.01 B	
	Instrumentation, including Control Devices, Parametric Monitoring, Communication, Spare Parts	included in quote	
	Site Development[4]	96,280	
	Buildings[4]	50,514	
Total Direct Installation Costs		*436,391*	
Indirect Installation Costs[2]			
	Engineering[4]	341,944	
	Construction and Field Expense	0.05 B	
	Contractor Fees	0.10 B	
	Start-up	0.02 B	
	Performance Test	0.01 B	
	Process Contingencies	0.03 B	
Total Indirect Installation Costs		*559,142*	
Additional Scoped Equipment Costs[4]			
	Ductwork[5]	2,730,849	C
	Ductwork Heater[6]	4,411,117	D
Total Capital Investment ($)		**9,171,774**	**TCI = B+C+D**

Table C-8 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.8, Page 2-42 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. RTO & Media Cost from Quote from B&W MEGTEC for 40,000 acfm lumber kiln, provided January 31, 2017.

Total RTO Equipment Cost Estimate for 40,000 acfm flow	**$897,800**
January 2017 Chemical Engineering Index	553.1
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.025
Total RTO Equipment Cost Estimate for 40,000 acfm flow (Indice Cost Ratio Adjusted)	$920,525

3. Cost estimate based on spark detection and suppression system at GP Hosford Plant and distance from unit to control device. Of 325.00 feet.
4. RTO & Media Cost from Quote submitted to GP Thorsby by Pro-Environmental, Inc, for a 40,000 acfm plywood veneer dryer, provided December 22, 2007 (revised February 1, 2008).

Site Development Cost Estimate	**$89,200**
Building Cost Estimate	$46,800
Engineering Cost Estimate	$316,800
February 2007 Chemical Engineering Index	525.4
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.079
Site Development Cost Estimate (Indice Cost Ratio Adjusted)	$96,280
Building Cost Estimate (Indice Cost Ratio Adjusted)	$50,514
Engineering Cost Estimate (Indice Cost Ratio Adjusted)	$341,944

5. +/- 30% Cost estimate of design, equipment and installation of 36" stainless steel ductwork for 1000 feet with insulation, heat tracing, and duct heaters to prevent condensation within ductwork. Ratioed quoted system to project duct length of 325 ft based on distance to nearest area for control device.

Ductwork Cost Estimate for 1,000 ft	$8,250,000
2015 Chemical Engineering Index	556.8
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.018
Ductwork Cost Estimate for 325 ft (Indice Cost Ratio Adjusted)	$2,730,849

6. Provided by AECOM estimator, February 2015 for ~40,000 cfm flow.

Ductwork Heater Cost Estimate for 40,000 acfm flow	$4,331,000
2015 Chemical Engineering Index	556.8
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.018
Ductwork Heater Cost Estimate for 40,000 acfm flow (Indice Cost Ratio Adjusted)	$4,411,117

Table C-9. Total Cost Evaluation for CDK 1 RTO & WESP

	Operating Cost	CDKs	OAQPS Notation[1]
Direct Annual Costs, $			
	Replacement of Media every 4 years	29,412	Based on experience at other Bldg Product facilities
	Operating Labor (0.5 hr, per 8-hr shift)	9,937	E
	Supervisory Labor	1,491	F = 0.15 × E
	Maintenance Labor (0.5 hr, per 8-hr shift)	14,251	G
	Maintenance Materials	14,251	H = G
	Electricity Usage	63,072	I
	Natural Gas - RTO	167,281	J
	Natural Gas - Duct Heater	245,280	duct heaters at 7 mmbtu/hr
Total Direct Annual Costs, $		*544,975*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs, $			
	Overhead	23,958	K = 0.60 × (E + F + G + H)
	Administrative Charges	183,435	L = 0.02 × TCI
	Property Tax	91,718	M = 0.01 × TCI
	Insurance	91,718	N = 0.01 × TCI
	Capital Recovery Factor[2]	0.0944	Based on 7% interest and 20-yr control equipment life
	Capital Recovery	865,751	O = CRF*TCI
Total Indirect Annual Costs, $		*1,256,580*	*IDAC = K + L + M + N + O*
Total Annual Cost RTO($/yr)		**1,801,555**	*TAC = DAC + IDAC*
Total Annual Cost WESP ($/yr)		**599,590**	*TAC = DAC + IDAC*
VOC as WPP1 Removed from Natural Gas-Fired Kiln (tpy)		250.34	VOC as WPP1
VOC as C Removed from Natural Gas-Fired Kiln (tpy)		195.17	VOC as C
Cost per ton of VOC as WPP1 Removed from Natural Gas-Fired Kiln ($/ton)		**$9,591**	*$/ton = TAC / Pollutant Removed*
Cost per ton of VOC as C Removed from Natural Gas-Fired Kiln ($/ton)		**$12,303**	*$/ton = TAC / Pollutant Removed*

Table C-9 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Equation 2.8a, Page 2-21 of Section 1, Chapter 2

Table C-10. Cost Analysis Supporting Information for CDK 2 & 3 WESP

Parameter	CDK	Units	Note(s)
Maximum Production Capacity	200	MMBf/yr	1
Airflow Capture Efficiency	80	%	1
PM Control Efficiency	95	%	2
Airflow	70,000	acfm	1
Pressure Drop	1.50	inches of H_2O	3
Fan Motor Efficiency	55	%	4
Fan Electricity Usage	91.0	kW-hr	5
Water Requirement	5	gal/min	3
	280	gal/hr	
Water Consumption Cost	0.0053	$/gal	6
Cost to Treat Water	0.375	$/1000 gal	6
Solid Material to be Disposed (PM Collected)	1.42	ton/yr	7
Landfill Fees	320	$/ton	6
Operating Labor Cost	18.2	$/hr	6
Maintenance Labor Cost	26.0	$/hr	6
Electricity Cost	0.06	$/kW-hr	6
WESP Equipment Life	20	years	8
Interest Rate	7%	%	8
January 2017 Chemical Engineering Index	553.1	n/a	9
June 2017 Chemical Engineering Index	567.1	n/a	9

Table C-10 Notes:

1. Engineering estimate based on design characteristics of a continuous lumber kiln.
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 3.14 (highest efficiency value),Page 3-41 of Section 6(Particulate Matter Controls), Chapter 3 (Electrostatic Precipitators).
3. Based on vendor discussions for previous installations.
4. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Page 2-41 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators). Fan efficiency vary from 40 to 70%. Average value of 55% was chosen
5. Per WESP Vendor quote, B&W MEGTEC, January 13, 2017.
6. Based on cost data from similar facility.
7. PM Collected = (PM (filt))*% Capture * 95% Control on captured PM
8. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Page 3-50 of Section 6 (Particulate Matter Controls), Chapter 2 (Electrostatic Precipitators). The typical equipment life of 20 years chosen.
9. Chemical Engineering Index

Table C-11. Capital Cost Evaluation for Wet ESP for CDK 2 & 3

Capital Cost	CDK	OAQPS Notation[1]
Purchased Equipment Costs		
Total Equipment Cost[2]	3,145,401	A
Instrumentation[2]	---	
Freight	157,270	0.05 × A
Total Purchased Equipment Costs	*3,302,671*	B
Direct Installation Costs		
Foundations and Supports	132,107	0.04 × B
Handling and Erection	1,651,335	0.50 × B
Electrical	264,214	0.08 × B
Piping	33,027	0.01 × B
Insulation	66,053	0.02 × B
Painting	66,053	0.02 × B
Total Direct Installation Costs	*2,212,789*	*C*
Indirect Installation Costs		
Engineering[2]	---	---
Construction and Field Expense	660,534	0.20 × B
Contractor Fees	330,267	0.10 × B
Start-up	33,027	0.01 × B
Performance Test	33,027	0.01 × B
Process Contingencies	99,080	0.03 × B
Total Indirect Installation Costs	*1,155,935*	*D*
Total Capital Investment ($)	**6,671,394**	**TCI = B + C + D**

Table C-11 Notes:

1. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 3.16,Page 3-46 of Section 6(Particulate Matter Controls), Chapter 3 (Electrostatic Precipitators).

2. Capital Costs are based the budgetary quote from B&W for a SonicKleen WESP (the pricing is for design, engineering and supply of equipment, drawings and flow sheets). Quote provided January 2017.

B&W Cost Estimate for 40,000 acfm flow	**$1,753,000**
January 2017 Chemical Engineering Index	553.1
June 2017 Chemical Engineering Index	567.1
Ratio of indices	1.03
Cost for airflow at design acfm CDK	$3,145,401

Table C-12. Annualized Cost Evaluation for Wet ESP for CDK 2 & 3

Operating Cost	CDK	
Direct Annual Costs, $ [1]		
Operating Labor (0.5-hr/day, 365 days/yr) [3]	3,312	E
Supervisory Labor	497	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	14,251	G
Maintenance Materials	14,251	H = G
Electricity	47,830	I
Water	13,000	J
Water Treatment	920	J
Waste Disposal (solid material)	454	J
Total Direct Annual Costs, $	*94,515*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs, $ [1]		
Overhead	19,387	K = 0.60 × (E + F + G + H)
Administrative Charges	133,428	L = 0.02 × TCI
Property Tax	66,714	M = 0.01 × TCI
Insurance	66,714	N = 0.01 × TCI
Capital Recovery Factor (CRF) [2]	0.0944	Based on 7% interest rate and 20 yr control equip. life
Capital Recovery	629,732	O = CRF*TCI
Total Indirect Annual Costs, $	*915,975*	*IDAC = K + L + M + N + O*
Total Annual Cost, $	**1,010,491**	*TAC = DAC + IDAC*

Table C-12 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Equation 2.8a, Page 2-21 of Section 1, Chapter 2
3. Based on operating experience at GP's OSB Plants

Table C-13. Cost Analysis Supporting Information for CDK 2 & 3 RTO

Parameter	CDKs	Units	Note(s)
Maximum Production Capacity	200	MMBf/yr	1
Uncontrolled Stack Inlet Emissions (VOC as WPP1)	549.00	tpy	2
Uncontrolled Stack Inlet Emissions (VOC as C)	428.00	tpy	2
Airflow Capture Efficiency	80	%	1
Removal Efficiency	95	%	3
VOC as WPP1 Removed	417.24	tpy	4
VOC as C Removed	325.28	tpy	4
Combustion Chamber Temperature (°F)	1600	° F	5
Airflow at stack conditions	70,000	acfm	1
Electricity Usage	210.0	kW-hr	6
Energy Required From Fuel	73,185	MMBtu/yr	6
Operating Labor Cost	18.2	$/hr	7
Maintenance Labor Cost	26.0	$/hr	7
Electricity Cost	0.060	$/kW-hr	7
Natural Gas	4.0	$/mmbtu	7
RTO Equipment Life	20	years	8
Interest Rate	7%	%	8
February 2007 Chemical Engineering Index	525.4	n/a	
2015 Chemical Engineering Index	556.8	n/a	
January 2017 Chemical Engineering Index	553.1	n/a	
June 2017 Chemical Engineering Index	567.1	n/a	

Table C-13 Notes:

1. Engineering estimate based on design characteristics of a continuous lumber kiln.

2. Potential inlet emissions based on maximum capacity and emission factor of 5.49 lb/MBf (VOC as WPP1) or 4.28 lb/MBf (VOC as C).

3. RTO control efficiency per Air Pollution Control Technology Fact Sheet - EPA-452/F-03-021. Higher RTO VOC control values have been demonstrated for some applications, but high control is not expected for low concentration high flow applications like those at the CDKs.

4. VOC Removed (tpy) = Capture efficiency (%) * Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy).

5. Based on design specifications for similar unit. Assumes 1,600 °F combustion chamber temperature and 200 °F exhaust temperature

6. Per RTO Vendor quote, B&W MEGTEC, January 13, 2017. Adjusted for proposed 70,000 cfm airflow from the 40,000 cfm airflow in vender quote.

7. Based on cost data from similar facility.

8. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators). Equipment life of 20 years chosen in lieu of 10 years for conservatism

Table C-14. Cost Evaluation for CDK 2 & 3 RTO

	Capital Cost	CDKs	OAQPS Notation[1]
Purchased Equipment Costs			
	Total RTO Equipment Cost[2]	$1,610,919	A
	Duct Fire Protection ($350/ft)[3]	218,750	
Total Purchased Equipment Costs		*1,829,669*	B
Direct Installation Costs			
	Foundations and Supports	0.08 B	
	Handling and Erection	0.14 B	
	Electrical	0.04 B	
	Insulation	0.01 B	
	Painting	0.01 B	
	Instrumentation, including Control Devices, Parametric Monitoring, Communication, Spare Parts	included in quote	
	Site Development[4]	96,280	
	Buildings[4]	50,514	
Total Direct Installation Costs		*659,101*	
Indirect Installation Costs[2]			
	Engineering[4]	341,944	
	Construction and Field Expense	0.05 B	
	Contractor Fees	0.10 B	
	Start-up	0.02 B	
	Performance Test	0.01 B	
	Process Contingencies	0.03 B	
Total Indirect Installation Costs		*726,174*	
Additional Scoped Equipment Costs[4]			
	Ductwork[5]	5,251,633	C
	Ductwork Heater[6]	7,719,455	D
Total Capital Investment ($)		**16,186,033**	**TCI = B+C+D**

Table C-14 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.8, Page 2-42 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. RTO & Media Cost from Quote from B&W MEGTEC for 40,000 acfm lumber kiln, provided January 31, 2017.

Total RTO Equipment Cost Estimate for 40,000 acfm flow	**$897,800**	
January 2017 Chemical Engineering Index	553.1	
June 2017 Chemical Engineering Index	567.1	
Ratio of Indices	1.025	
Total RTO Equipment Cost Estimate for 70,000 acfm flow (Indice Cost Ratio Adjusted)	$1,610,919	
3. Cost estimate based on spark detection and suppression system at GP Hosford Plant and distance from unit to control device. Of	625.00	feet.

4. RTO & Media Cost from Quote submitted to GP Thorsby by Pro-Environmental, Inc. for a 40,000 acfm plywood veneer dryer, provided December 22, 2007 (revised February 1, 2008).

Site Development Cost Estimate	**$89,200**
Building Cost Estimate	$46,800
Engineering Cost Estimate	$316,800
February 2007 Chemical Engineering Index	525.4
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.079
Site Development Cost Estimate (Indice Cost Ratio Adjusted)	$96,280
Building Cost Estimate (Indice Cost Ratio Adjusted)	$50,514
Engineering Cost Estimate (Indice Cost Ratio Adjusted)	$341,944

4. +/- 30% Cost estimate of design, equipment and installation of 36" stainless steel ductwork for 1000 feet with insulation, heat tracing, and duct heaters to prevent condensation within ductwork. Ratioed quoted system to project duct length of 625 ft based on distance to nearest area for control device.

Ductwork Cost Estimate for 1,000 ft	$8,250,000
2015 Chemical Engineering Index	556.8
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.018
Ductwork Cost Estimate for 625 ft (Indice Cost Ratio Adjusted)	$5,251,633

6. Provided by AECOM estimator, February 2015 for ~40,000 cfm flow.

Ductwork Heater Cost Estimate for 40,000 acfm flow	$4,331,000
2015 Chemical Engineering Index	556.8
June 2017 Chemical Engineering Index	567.1
Ratio of Indices	1.018
Ductwork Heater Cost Estimate for 70,000 acfm flow (Indice Cost Ratio Adjusted)	$7,719,455

Table C-15. Total Cost Evaluation for CDK 2 & 3 RTO & WESP

	Operating Cost	CDKs	OAQPS Notation[1]
Direct Annual Costs, $			
	Replacement of Media every 4 years	51,471	Based on experience at other Bldg Product facilities
	Operating Labor (0.5 hr, per 8-hr shift)	9,937	E
	Supervisory Labor	1,491	F = 0.15 × E
	Maintenance Labor (0.5 hr, per 8-hr shift)	14,251	G
	Maintenance Materials	14,251	H = G
	Electricity Usage	110,376	I
	Natural Gas - RTO	292,742	J
	Natural Gas - Duct Heater	245,280	duct heaters at 7 mmbtu/hr
Total Direct Annual Costs, $		*739,799*	*DAC = E + F + G + H + I + J*
Indirect Annual Costs, $			
	Overhead	23,958	K = 0.60 × (E + F + G + H)
	Administrative Charges	323,721	L = 0.02 × TCI
	Property Tax	161,860	M = 0.01 × TCI
	Insurance	161,860	N = 0.01 × TCI
	Capital Recovery Factor[2]	0.0944	Based on 7% interest and 20-yr control equipment life
	Capital Recovery	1,527,847	O = CRF*TCI
Total Indirect Annual Costs, $		*2,199,247*	*IDAC = K + L + M + N + O*
Total Annual Cost RTO($/yr)		**2,939,045**	*TAC = DAC + IDAC*
Total Annual Cost WESP ($/yr)		**1,010,491**	*TAC = DAC + IDAC*
VOC as WPP1 Removed from Natural Gas-Fired Kilns 2 & 3 (tpy)		417.24	
VOC as C Removed from Natural Gas-Fired Kilns 2 & 3 (tpy)		325.28	
Cost per ton of VOC as WPP1 Removed from Natural Gas-Fired Kilns 2 & 3 ($/ton)		**$9,466**	*$/ton = TAC / Pollutant Removed*
Cost per ton of VOC as C Removed from Natural Gas-Fired Kilns 2 & 3 ($/ton)		**$12,142**	*$/ton = TAC / Pollutant Removed*

Table C-15 Notes:

1. U.S. EPA OAQPS, *EPA Air Pollution Control Cost Manual (6th Edition)*, January 2002, Table 2.10, Page 2-45 of Section 3.2 (VOC Destruction Controls), Chapter 2 (Incinerators).
2. U.S. EPA OAQPS, EPA Air Pollution Control Cost Manual (6th Edition), January 2002, Equation 2.8a, Page 2-21 of Section 1, Chapter 2

Table C-16. RESULTS OF RBLC SEARCH FOR LUMBER KILN VOC BACT

RBLCID	Facility Name	State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Control Method Description	Emission Limit
AL-0235	ALBERTVILLE SAWMILL	AL	4/9/2008	TWO 182.14 MBF, STEAM-HEADED LUMBER DRY KILNS (NORTH & SOUTH - K100/K101)		182.14 MBF	OPERATE W/ WET BULB SET POINT DRYING SCHEDULE OF LESS THAN OR EQUAL TO 185F; DAILY AND MONTHLY KILN I/M PROCEDURES	7 LB/MBF
AL-0257	WEST FRASER-OPELIKA LUMBER MILL	AL	11/1/2013	Two(2) 87.5 MMBF/YR Continuous kilns with a 35 MMBtu/hr direct-fired wood burner	Wood Shavings	175 MMBF/YR		3.76 LB/MBF
AL-0258	WEST FRASER, INC. - MAPLESVILE MILL	AL	4/15/2013	Two(2) 100 MMBF/Y Continuous direct fired kiln	Wood Residuals	200 MMBF/YR		3.76 LB/MBF
AL-0259	THE WESTERVELT COMPANY	AL	8/21/2013	Three (3) 93 MMBF/Y Continous, Dual path, indirect fired kilns	Steam (Indirect heat)	0		4.57 LB/MMBF
AL-0260	THE WESTERVELT COMPANY	AL	1/4/2011	Two (2) 125 MMBtu/Hr. Wood-fired Boilers	Wood Residuals	125 MMBTU/H each		0.5 LB/MMBTU
AL-0273	MILLPORT WOOD PRODUCTS FACILITY	AL	12/30/2014	Continuous direct-lumber dry kiln	Green sawdust	140000 mbf/yr	Proper maintenance & operating practice requirements. Test method information: Method 18/25.	4.7 LB
*AL-0305	RESOLUTE FOREST PRODUCTS - ALABAMA SAWMILL	AL	6/24/2015	Continuous Direct-Fired Lumber Dry Kilns with 35 mmbtu/hr Wood Fired Burner	Wood	108.33 mmbf/yr - each		3.76 LB/MBF
AR-0101	BIBLER BROTHERS LUMBER COMPANY	AR	8/25/2008	SN-07G AND SN-13G CONTINOUS OPERATING KILNS	WOOD RESIDUE	25 MMBTU/H		3.8 LB/MBF
AR-0102	ANTHONY TIMBERLANDS, INC.	AR	9/16/2009	KILN #3 INDIRECT-FIRED	NONE	200 MMBF/YR		3.5 LB/MBF
AR-0102	ANTHONY TIMBERLANDS, INC.	AR	9/16/2009	KILN #4 INDIRECT-FIRED	NONE	200 MMBF/YR		3.5 LB/MBF
AR-0102	ANTHONY TIMBERLANDS, INC.	AR	9/16/2009	KILN #5 INDIRECT-FIRED	NONE	200 MMBF/YR		3.5 LB/MBF
AR-0120	OLA	AR	2/11/2015	Dry Kiln No. 3 (SN-06)	None	105 MMBF/yr		33.3 LB/H
AR-0120	OLA	AR	2/11/2015	Drying Kiln No. 4 (SN-12)	None	105 MMBF/yr		33.2 LB/H
AR-0120	OLA	AR	2/11/2015	Drying Kiln No. 5 (SN-21)	wood residue	60 MMBF/yr		23.5 LB/H
AR-0122	GEORGIA-PACIFIC WOOD PRODUCTS SOUTH LLC (GURDON PLYWOOD AND	AR	2/6/2015	SN-09 #4 LUMBER KILN	NATURAL GAS	130 MILLION BOARD FEET		3.8 LB/MBF
AR-0123	DELTIC TIMBER CORPORATION WALDO	AR	10/18/2013	KILN NO. 3		0	PROPER KILN OPERATION	27 LB/H
AR-0123	DELTIC TIMBER CORPORATION WALDO	AR	10/18/2013	KILN NO. 4		0		46.2 LB/H
AR-0123	DELTIC TIMBER CORPORATION WALDO	AR	10/18/2013	KILN NO. 5		0		27 LB/H
AR-0124	EL DORADO SAWMILL	AR	8/3/2015	LUMBER DRYING KILN SN-01	NATURAL GAS	45 MMBTU/H	PROPER MAINTENANCE AND OPERATION	3.8 LB/MBF
AR-0124	EL DORADO SAWMILL	AR	8/3/2015	LUMBER DRYING KILN SN-02	NATURAL GAS	45 MMBTU/H		3.8 LB/MBF
AR-0124	EL DORADO SAWMILL	AR	8/3/2015	LUMBER DRYING KILN SN-03	NATURAL GAS	45 MMBTU/H		3.8 LB/MBF
AR-0127	DELTIC TIMBER CORPORATION - OLA	AR	10/13/2015	STEAM HEATED CONTINUOUS KILN NO. 3		79000 MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	33.3 LB/H
AR-0127	DELTIC TIMBER CORPORATION - OLA	AR	10/13/2015	STEAM HEATED CONTINUOUS KILN NO. 4		79000 MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	33.3 LB/H
AR-0127	DELTIC TIMBER CORPORATION - OLA	AR	10/13/2015	DIRECT-FIRED CONTINUOUS KILN NO. 5		79000 MBF/YR	PROPER DRYING SCHEDULE AND A TEMPERATURE BASED ON MOISTURE CONTENT OF THE LUMBER TO BE DRIED AND THE MANUFACTURER'S SPECIFICATIONS	38.2 LB/H
AR-0135	WEST FRASER, INC. (LEOLA LUMBER MILL)	AR	8/5/2013	LUMBER KILN, CONTINUOUS, INDIRECT		275 MMBF/YR		3.5 LB/MBF
AR-0143	CADDO RIVER LLC	AR	2/8/2017	CONTINUOUS LUMBER DRYING KILNS	WOOD	1.16E+08 BOARD FEET		53.2 LB/H
FL-0315	NORTH FLORIDA LUMBER/BRISTOL SAW MILL	FL	8/4/2009	Wood lumber kiln	steam heated	92000000 board-f lumber/yr	Best operating practices: 1) minimize over-drying lumber; 2) maintain consistent moisture content for processed lumber charge; and 3) dry at the minimum temperature.	116.93 T/YR
FL-0340	PERRY MILL	FL	4/1/2014	Direct-fired lumber drying kiln	Waste wood	90 million board ft/yr	At a minimum, the permittee shall operate the kiln in accordance with the following best operating practices (BMP). a.Minimize over-drying the lumber; b.Maintain consistent moisture content for the processing lumber charge; and c.Dry at the minimum temperature. The permittee shall develop and operate in accordance with a written plan to implement the above BMP and any others required by the kiln manufacturer. Ninety days before the initial startup of the kiln, the permitted shall submit to the Compliance Authority the BMP plan. The Title V air operation permit shall include the submitted BMP plan.	3.5 LB/MBF

Table C-16. RESULTS OF RBLC SEARCH FOR LUMBER KILN VOC BACT

RBLCID	Facility Name	State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Control Method Description	Emission Limit
FL-0343	WHITEHOUSE LUMBER MILL	FL	9/9/2014	Direct-Fired Continuous Kilns	Wood waste	40 MMBTU/H	Proper Maintenance and Operating Procedures: â€¢Minimize over-drying the lumber. â€¢Maintain consistent moisture content for the processing lumber charge. â€¢Dry the lumber at the minimum temperature. â€¢Develop a written Operation and Maintenance (O&M) plan identifying the above practices and the operation and maintenance requirements from the kiln manufacturer. â€¢Record and monitor the total monthly amount and 12-month annual total of wood dried in each kiln (board-feet). â€¢Record the calculated monthly and 12-month annual total emissions of VOC to demonstrate compliance with the process and emissions limits.	3.76 LB/MBF
FL-0358	GRACEVILLE LUMBER MILL	FL	7/14/2016	Direct-fired continuous lumber drying Kiln No. 5	Sawdust	110000 Thousand bf/yr	Lumber moisture used as proxy for VOC emissions -- product that is over dried likely means more VOC driven off and emitted	3.5 LB/MBF
GA-0146	SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	GA	4/25/2012	KILN 3	WASTE WOOD	65000000 BF/YR	PROPER MAINTENANCE AND OPERATION	3.83 LB/MBF
GA-0146	SIMPSON LUMBER CO, LLC MELDRIM OPERATIONS	GA	4/25/2012	KILN 4	WASTE WOOD	73000000 BF/YR	PROPER MAINTENANCE AND OPERATION	3.93 LB/MBF
LA-0252	JOYCE MILL	LA	8/16/2011	Lumber kilns		300 million board feet/yr	properly design and operation	930 T/YR
LA-0281	SOUTHWEST LOUISIANA LUMBER OPERATIONS	LA	1/31/2014	EP-3K -Wood-Fired Dry Kiln No. 1	Wood	60000 MBF/YR	Proper kiln design & operation; annual production limit	29.27 LB/H
LA-0281	SOUTHWEST LOUISIANA LUMBER OPERATIONS	LA	1/31/2014	EP-4K â€" Wood-Fired Dry Kiln No. 2	Wood	60000 MBF/YR	Proper kiln design & operation; annual production limit	29.27 LB/H
LA-0281	SOUTHWEST LOUISIANA LUMBER OPERATIONS	LA	1/31/2014	EP-5K â€" Wood-Fired Dry Kiln No. 3	Wood	60000 MBF/YR	Proper kiln design & operation; annual production limit	29.27 LB/H
LA-0281	SOUTHWEST LOUISIANA LUMBER OPERATIONS	LA	1/31/2014	EP-6K â€" Wood-Fired Dry Kiln No. 4	Wood	60000 MBF/YR	Proper kiln design & operation; annual production limit	29.27 LB/H
LA-0293	CHOPIN MILL	LA	3/18/2014	Lumber Dry Kilns Nos. 1 & 2 (EQT 37 & 38)		25000 M BD-FT/YR	Good operating practices to limit VOC emissions to 4.29 lb/M bd-ft (12-month rolling average).	24.51 LB/MBF
LA-0294	DODSON DIVISION	LA	12/30/2013	Dry Kiln 1 (033, EQT 15)		14 M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	79.4 LB/H
LA-0294	DODSON DIVISION	LA	12/30/2013	Dry Kiln 2 (034, EQT 16)		14 M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	79.4 LB/H
LA-0294	DODSON DIVISION	LA	12/30/2013	Dry Kiln 3 (035, EQT 17)		16 M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	90.74 LB/H
LA-0294	DODSON DIVISION	LA	12/30/2013	Dry Kiln 4 (051, EQT 32)		16 M BD-FT/H	Good operating practices, including proper design, operation, and maintenance	90.74 LB/H
SC-0135	NEW SOUTH COMPANIES, INC. - CONWAY PLANT	SC	9/24/2012	LUMBER KILNS		380.56 MMBD-FT/YR	PROPER MAINTENANCE AND OPERATION	799.18 T/YR
SC-0136	SIMPSON LUMBER COMPANY, LLC	SC	8/29/2012	DIRECT-FIRED LUMBER DRYING KILN NO. 4	DRY WOOD WASTE	34 MMBTU/H	WORK PRACTICE STANDARDS	104 T/YR
SC-0138	ELLIOTT SAWMILLING COMPANY	SC	4/14/2009	DIRECT FIRED LUMBER DRYING KILN NO.5	SAWDUST	35 MMBTU/H	WORK PRACTICE STANDARDS	119 T/YR
SC-0149	KLAUSNER HOLDING USA, INC	SC	1/3/2013	LUMBER DRYING KILNS EU007		700 million board feet/yr		3.5 LB/MBF
SC-0151	WEST FRASER - NEWBERRY LUMBER MILL	SC	4/30/2013	TWO - 35 MMBTU/H DUAL PATH, DIRECT FIRED, CONTINUOUS LUMBER KILNS, 15 THOUSAND BF/H, EACH	SAWDUST	0	PROPER OPERATION AND GOOD OPERATING PRACTICES	3.76 LB/MBF
*SC-0162	NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	SC	6/18/2013	DKN1	STEAM HEATED	60 MMBF/YR	PROPER OPERATION AND MAINTENANCE	343.98 T/YR
*SC-0162	NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	SC	6/18/2013	DKN4	STEAM HEATED	60 MMBF/YR	MAINTENACE AND OPERATING PRACTICES	343.98 T/YR
*SC-0162	NEW SOUTH LUMBER COMPANY, INC. DARLINGTON PLANT	SC	6/18/2013	DKN5	WOOD WASTE	75 MMBF/YR	PROPER MAINTENANCE AND OPERATION	141 T/YR
SC-0163	KAPSTONE CHARLESTON KRAFT LLC-SUMMERVILLE	SC	1/20/2015	LUMBER KILNS		194.83 MMBF/YR	PROPER MAINTENANCE AND OPERATION	225.6 T/YR
SC-0164	SIMPSON LUMBER COMPANY, LLC	SC	6/20/2014	LUMBER KILNS		166 MMBF/YR	PROPER OPERATION AND MAINTENANCE	156 T/YR
SC-0165	NEW SOUTH COMPANIES, INC. - CONWAY PLANT	SC	10/15/2014	LUMBER KILNS		295.6 MMBF/YR	PROPER MAINTENANCE AND OPERATION	602 T/YR
*SC-0166	NEW SOUTH LUMBER COMPANY - DARLINGTON INC.	SC	1/26/2016	TWO KILNS - KLN5 AND KLN6	GREEN SAWDUST	85 MILLION BD-FT/YR	PROPER OPERATION AND MAINTENANCE	0
*SC-0169	CAMDEN PLANT	SC	6/18/2014	DKN6 - DIRECT FIRED CONTINUOUS LUMBER DRYING KILN	WOOD	80 MMBD-FT/YR		150.4 T/YR

Table C-16. RESULTS OF RBLC SEARCH FOR LUMBER KILN VOC BACT

RBLCID	Facility Name	State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Control Method Description	Emission Limit
*SC-0172	NEW SOUTH COMPANIES, INC. - CONWAY PLANT	SC	10/15/2014	LUMBER KILNS		295.6 MMBD-FT/YR	PROPER MAINTENANCE AND OPERATION	602 T/YR
*SC-0176	GEORGIA PACIFIC - MCCORMICK SAWMILL	SC	10/27/2016	Direct fired continuous lumber kiln	Wood Fired	26 MMBTU/HR		0
TX-0584	TEMPLE INLAND PINELAND MANUFACTURING COMPLEX	TX	8/12/2011	Dry studmill kilns 1 and 2	wood	156000 boardfeet per charge	good operating practice and maintenance	2.49 LB/MBF
TX-0607	LUMBER MILL	TX	12/15/2011	Continuous lumber kilns (2)	wood	275 MMBF/YR	proper temperature and process management; drying to appropriate moisture content	3.5 LB/MBF

Table C-17. RESULTS OF RBLC SEARCH FOR ENGINE VOC BACT

RBLCID	Facility Name	State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Control Method Description	Emission Limit	Emission Limit (converted)
*WI-0261	ENBRIDGE ENERGY - SUPERIOR TERMINAL	WI	6/12/2014	EG7 - Diesel Emergency Electric Generator w/ tank	Diesel	197 BHP	NSPS engine [Tier 3 emergency engine]. EG7 Storage tank, conventional fuel oil storage tank, good operating practices; limiting leakage, spills. (FT01). Engine limited to 200 hours / year (total) and NSPS requirements.	3.75 GRAM / HP-HR	8.267E-03 LB/HP-H
LA-0313	ST. CHARLES POWER STATION	LA	8/31/2016	SCPS Emergency Diesel Firewater Pump 1	Diesel	282 HP	Good combustion practices	1.87 LB/H	6.631E-03 LB/HP-H
MD-0044	COVE POINT LNG TERMINAL	MD	6/9/2014	5 EMERGENCY FIRE WATER PUMP ENGINES	ULSD	350 HP	USE ONLY ULSD, GOOD COMBUSTION PRACTICES, AND DESIGNED TO ACHIEVE EMISSION LIMIT	3 G/HP-H	6.614E-03 LB/HP-H
SC-0113	PYRAMAX CERAMICS, LLC	SC	2/8/2012	FIRE PUMP	Diesel	500 HP	CERTIFIED ENGINES THAT COMPLY WITH NSPS, SUBPART IIII. HOURS OF OPERATION LIMITED TO 100 HOURS PER YEAR FOR MAINTENANCE AND TESTING.	4 GR/KW-H	6.533E-03 LB/HP-H
ID-0018	LANGLEY GULCH POWER PLANT	ID	6/25/2010	FIRE PUMP ENGINE	Diesel	235 KW	TIER 3 ENGINE-BASED, GOOD COMBUSTION PRACTICES (GCP)	4 G/KW-H	6.533E-03 LB/HP-H
SC-0159	US10 FACILITY	SC	7/9/2012	FIRE PUMPS, FIRE1, FIRE2, FIRE3	Diesel	211 KW	BACT HAS BEEN DETERMINED TO BE COMPLIANCE WITH NSPS, SUBPART IIII, 40 CFR60.4202 AND 40 CFR60.4205.	4 GKW-H	6.533E-03 LB/HP-H
*KS-0030	MID-KANSAS ELECTRIC COMPANY, LLC - RUBART STATION	KS	3/31/2016	Compression ignition RICE emergency fire pump	ULSD	197 HP		1.14 G/HP-HR	2.513E-03 LB/HP-H
AK-0082	POINT THOMSON PRODUCTION FACILITY	AK	1/23/2015	Airstrip Generator Engine	ULSD	490 hp		0.0025 LB/HP-H	2.500E-03 LB/HP-H
LA-0224	ARSENAL HILL POWER PLANT	LA	3/20/2008	DFP DIESEL FIRE PUMP	Diesel	310 HP	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE	0.77 LB/H	2.484E-03 LB/HP-H
OK-0129	CHOUTEAU POWER PLANT	OK	1/23/2009	EMERGENCY FIRE PUMP (267-HP DIESEL)	LSD	267 HP	GOOD COMBUSTION	0.66 LB/H	2.472E-03 LB/HP-H
LA-0254	NINEMILE POINT ELECTRIC GENERATING PLANT	LA	8/16/2011	EMERGENCY FIRE PUMP	Diesel	350 HP	ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES	1 G/HP-H	2.205E-03 LB/HP-H
*KS-0036	WESTAR ENERGY - EMPORIA ENERGY CENTER	KS	3/18/2013	Cummins 6BTA 5.9F-1 Diesel Engine Fire Pump	Diesel	182 BHP	utilize efficient combustion/design technology	0.77 G/BHP-H	1.698E-03 LB/HP-H
OH-0317	OHIO RIVER CLEAN FUELS, LLC	OH	11/20/2008	FIRE PUMP ENGINES (2)	Diesel	300 HP	GOOD COMBUSTION PRACTICES AND GOOD ENGINE DESIGN	0.26 LB/H	8.667E-04 LB/HP-H
OH-0352	OREGON CLEAN ENERGY CENTER	OH	6/18/2013	Emergency fire pump engine	Diesel	300 HP	Purchased certified to the standards in NSPS Subpart IIII	0.25 LB/H	8.333E-04 LB/HP-H
*WV-0025	MOUNDSVILLE COMBINED CYCLE POWER PLANT	WV	11/21/2014	Fire Pump Engine	Diesel	251 HP		0.17 LB/H	6.773E-04 LB/HP-H
IL-0114	CRONUS CHEMICALS, LLC	IL	9/5/2014	Firewater Pump Engine	Diesel	373 hp	Tier IV standards for non-road engines at 40 CFR 1039.102, Table 7.	0.4 G/KW-H	6.533E-04 LB/HP-H
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/3/2012	TWO (2) FIREWATER PUMP DIESEL ENGINES	Diesel	371 BHP	COMBUSTION DESIGN CONTROLS AND USAGE LIMITS	0.16 LB/H	4.313E-04 LB/HP-H
IA-0105	IOWA FERTILIZER COMPANY	IA	10/26/2012	Fire Pump	Diesel	290 HP	good combustion practices	0.25 G/KW-H	4.083E-04 LB/HP-H
OK-0164	MIDWEST CITY AIR DEPOT	OK	1/8/2015	Diesel-Fueled Fire Pump Engines	ULSD	300 HP	1. Good Combustion Practices.	0.15 GRAMS PER HP-HR	3.307E-04 LB/HP-H
IN-0173	MIDWEST FERTILIZER CORPORATION	IN	6/4/2014	FIRE PUMP		500 HP	GOOD COMBUSTION PRACTICES	0.141 G/BHP-H	3.109E-04 LB/HP-H
IN-0173	MIDWEST FERTILIZER CORPORATION	IN	6/4/2014	RAW WATER PUMP	Diesel	500 HP	GOOD COMBUSTION PRACTICES	0.141 G/BHP-H	3.109E-04 LB/HP-H
IN-0180	MIDWEST FERTILIZER CORPORATION	IN	6/4/2014	FIRE PUMP		500 HP	GOOD COMBUSTION PRACTICES	0.141 G/B-HP-H	3.109E-04 LB/HP-H
IN-0180	MIDWEST FERTILIZER CORPORATION	IN	6/4/2014	RAW WATER PUMP	Diesel	500 HP	GOOD COMBUSTION PRACTICES	0.141 G/B-HP-H	3.109E-04 LB/HP-H
IN-0179	OHIO VALLEY RESOURCES, LLC	IN	9/25/2013	DIESEL-FIRED EMERGENCY WATER PUMP	Diesel	481 BHP	GOOD COMBUSTION PRACTICES	0.141 G/B-HP-H	3.109E-04 LB/HP-H
*PA-0309	LACKAWANNA ENERGY CTR/JESSUP	PA	12/23/2015	Fire pump engine	ULSD	290 HP		0.12 GM/HP-HR	2.646E-04 LB/HP-H
LA-0301	LAKE CHARLES CHEMICAL COMPLEX ETHYLENE 2 UNIT	LA	5/23/2014	Firewater Pump Nos. 1-3 (EQTs 997, 998, & 999)	Diesel	500 HP	Compliance with 40 CFR 60 Subpart IIII and operating the engine in accordance with the engine manufacturer's instructions and/or written procedures (consistent with safe operation) designed to maximize combustion efficiency and minimize fuel usage	0.1 LB/HR	2.000E-04 LB/HP-H

Table C-18. RESULTS OF RBLC SEARCH FOR TANKS VOC BACT

RBLCID	Facility Name	State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Control Method Description	Emission Limit
FL-0285	PROGRESS BARTOW POWER PLANT	FL	01/26/2007	TWO NOMINAL 3.5 MILLION GALLON DISTILLATE FUEL OIL STORAGE TANKS	FUEL OIL			N/A
FL-0286	FPL WEST COUNTY ENERGY CENTER	FL	01/10/2007	TWO NOMINAL 6.3 MILLION GALLON DISTILLATE FUEL OIL STORAGE TANKS	DISTILLATE FUEL OIL			N/A
FL-0346	LAUDERDALE PLANT	FL	04/22/2014	Three ULSD fuel oil storage tanks		N/A	The Department sets BACT for these storage tanks to minimize VOC emissions as the use of pressure relief valves/vapor condensers. In lieu of pressure relief valves/vapor condensers, FPL as an alternative, can use tanks with internal floating roofs or the equivalent to minimize VOC emissions.	N/A
FL-0354	LAUDERDALE PLANT	FL	08/25/2015	Two 3-million gallon ULSD storage tanks		N/A	Low vapor pressure prevents evaporative losses	N/A
IA-0088	ADM CORN PROCESSING - CEDAR RAPIDS	IA	06/29/2007	CORROSION INHIBITOR STORAGE TANK		8500 GALLON STORAGE		0.85 T/YR
IA-0089	HOMELAND ENERGY SOLUTIONS, LLC, PN 06-672	IA	08/08/2007	ADDITIVE (CORROSION INHIBITOR) TANK, T66 (07-A-977P)		2300 GAL		0.05 T/YR
IL-0119	PHILLIPS 66 PIPELINE LLC	IL	01/23/2015	Distillate Storage Tank (Tank 2001)		200000 bbl	low vapor pressure material	0.1 PSIA
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/03/2012	EMERGENCY GENERATOR ULSD TANKS		550 GALLONS EA	GOOD DESIGN AND OPERATING PRACTICES	N/A
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/03/2012	FIRE PUMP ENGINE ULSD TANKS		70 GALLONS EA	GOOD COMBUSTION PRACTICE AND FUEL SPECIFICATION	N/A
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/03/2012	VEHICLE GASOLINE DISPENSING TANK		650 GALLONS	SUBMERGED FILL PIPES AND STAGE 1 VAPOR CONTROL	N/A
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/03/2012	VEHICLE DIESEL TANK		650 GALLONS	GOOD COMBUSTION PRACTICE AND FUEL SPECIFICATION	N/A
IN-0158	ST. JOSEPH ENEGRY CENTER, LLC	IN	12/03/2012	EMERGENCY GENERATOR ULSD TANK		300 GALLONS	GOOD COMBUSTION PRACTICE AND FUEL SPECIFICATION	N/A
LA-0213	ST. CHARLES REFINERY	LA	11/17/2009	TANKS - FOR HEAVY MATERIALS			EQUIPPED WITH FIXED ROOF AND COMPLY WITH 40 CFR 63 SUBPART CC	N/A
LA-0228	BATON ROUGE JUNCTION FACILITY	LA	11/02/2009	EQT031-EQT035 FIVE DISTILLATE TANKS (T006-T010)		240000 BBL (EACH)	SUBMERGED FILL PIPES AND PRESSURE/VACUUM VENTS	45 T/YR
LA-0232	STERLINGTON COMPRESSOR STATION	LA	06/24/2008	CONDENSATE STORAGE TANK		5760 BBL/YR	SUBMERGED FILL PIPE	1.28 LB/H
LA-0237	ST. ROSE TERMINAL	LA	05/20/2010	HEAVY FUEL OIL STORAGE TANKS (18)		N/A	FIXED ROOF	67.53 T/YR
LA-0265	ST. CHARLES REFINERY	LA	10/02/2012	FR Storage Tanks EQT0087 and EQT0088		N/A	Comply with 40 CFR 63 Subpart CC (Group 2)	N/A
LA-0276	BATON ROUGE JUNCTION FACILITY	LA	12/15/2016	Vertical Fixed Roof Tanks 174, 175, 176		N/A	Submerged fill pipes and pressure/vacuum vents	N/A
LA-0309	BENTELER STEEL TUBE FACILITY	LA	06/04/2015	Gasoline Tank S16		600 gallons	Submerged fill pipe	N/A
LA-0314	INDORAMA LAKE CHARLES FACILITY	LA	08/03/2016	Unleaded Gasoline Tank TK-33		1000 gallons	Submerged fill pipe and LAC 33:III.2103	N/A
LA-0320	ST. CHARLES REFINERY	LA	03/05/2014	Equilization Tank 2013-16		N/A	Comply with 40 CFR 63 Subpart CC	N/A
MA-0040	CHELSEA TERMINAL	MA	08/20/2008	Heated Residual Oil Storage Tanks		N/A	Regenerative Thermal Oxidizer with 99% destruction efficiency	7.7 TONS
NV-0047	NELLIS AIR FORCE BASE	NV	02/26/2008	FUEL TANKS/LOADING RACKS/FUEL DISPENSING	GASOLINE		STAGE 1 AND STAGE 2 VAPOR RECOVERY SYSTEMS AND LIMIT OF REID VAPOR PRESSURE TO 10 PSI	0.0033 LB/GAL. THROUGHPUT
OH-0317	OHIO RIVER CLEAN FUELS, LLC	OH	11/20/2008	FIXED ROOF TANKS (8)	DIESEL FUEL OIL	262500 GAL/D	SUBMERGED FILL	0.8 T/YR
*OK-0148	BUFFALO CREEK PROCESSING PLANT	OK	09/12/2012	Condensate Tanks (Petroleum Storage-Fixed Roof Tanks)	N/A	1.46 MMBPY	Flare.	N/A
OK-0153	ROSE VALLEY PLANT	OK	03/01/2013	CONDENSATE TANKS	NA	9198000 GAL/YR	FLARE	0.82 TPY
OK-0154	MOORELAND GENERATING STA	OK	07/02/2013	DIESEL TANK (2800 GALLON)	NA	2800 GALLONS	FIXED-ROOF TANK	N/A
OR-0050	TROUTDALE ENERGY CENTER, LLC	OR	03/05/2014	Storage tank	ULSD	N/A	Submerged fill line; Vapor balancing during tank filling.	N/A
TX-0656	GAS TO GASOLINE PLANT	TX	05/16/2014	Fixed Roof Tanks (3)		800000 GAL/YR	WATER SCRUBBER	1.65 T/YR
TX-0728	PEONY CHEMICAL MANUFACTURING FACILITY	TX	04/01/2015	Diesel and lube oil tanks		10708 gallons/yr	low vapor pressure fuel, submerged fill, white tank	0.02 LB/H
TX-0731	CORPUS CHRISTI TERMINAL CONDENSATE SPLITTER	TX	04/10/2015	Petroleum Liquids Storage in Fixed Roof Tanks		3.4 MMBbl/yr/t	Temperature reduced to maintain volatile organic compound (VOC) vapor pressure < 0.5 pounds per square inch actual (psia) at all times.	15.78 TONS/YR/TANK
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	TX	06/19/2015	Storage Tanks, TK-110, TK-111, TK-112		57960 gal/hr	Tanks are required to be painted white and be equipped with submerged fill pipes	3.07 LB/HR
TX-0756	CCI CORPUS CHRISTI CONDENSATE SPLITTER FACILITY	TX	06/19/2015	Storage Tanks, TK-113, TK-114, and TK-115		47000000 gal/yr/tank	Tanks are required to be painted white and be equipped with submerged fill pipes	0.85 LB/HR
TX-0772	PORT OF BEAUMONT PETROLEUM TRANSLOAD TERMINAL (PBPTT)	TX	11/06/2015	Petroleum Liquids Storage in Fixed Roof Tanks		47.62 BBL/YR	Tank uses submerged fill and is aluminum in color.	0.01 T/YR
TX-0799	BEAUMONT TERMINAL	TX	06/08/2016	Storage Tanks - fixed roof		N/A	Fixed-roof tanks (EPNs 168, 222, 225, 227,229, 254, 256, 257, 258, 259, 475, and 476) will use submerged fill and have white exterior surfaces. Fuel tanks (EPN DTK01 and GTK01) are horizontal fixed-roof design and will use submerged fill and have white or aluminum exterior surfaces.	72.5 T/YR
*TX-0808	HOUSTON FUEL OIL TERMINAL	TX	09/02/2016	Storage Tank		N/A	Insulated, submerged fill, painted white	0.1 T/YR
*TX-0813	ODESSA PETROCHEMICAL PLANT	TX	11/22/2016	Petroleum Liquid Storage in Fixed Roof tanks		N/A	Submerged fill pipe, reflective or white exterior paint.	0.01 T/YR
*TX-0825	PASADENA TERMINAL	TX	07/14/2017	Horizontal fixed roof storage tanks		N/A	painted white, has submerged fill	0.37 T/YR
*TX-0825	PASADENA TERMINAL	TX	07/14/2017	Horizontal fixed roof storage tanks maintenance, start up, and shutdown		N/A	Degassing and refilling losses will be controlled by vapor combustor with a 99.5% destruction efficiency.	26.28 T/YR

APPENDIX D

PERMIT APPLICATION FORMS

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

Facility Number 309 - 0075

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. Name of Facility, Firm, or Institution: Talladega Sawmill

Facility Physical Location Address

Street & Number: 440 Ironaton Cutoff Road

City: Talladega **County:** Talladega **Zip:** 35160

Facility Mailing Address (If different from above)

Address or PO Box:

City: **State:** **Zip:**

Owner's Business Mailing Address

2. Owner: Georgia- Pacific Wood Products

Street & Number: 133 Peachtree Street NE **City:** Atlanta

State: GA **Zip:** 30303 **Telephone:** 404-652-4000

Responsible Official's Business Mailing Address

3. Responsible Official: Jim Brody **Title:** Vice President of Operations

Street & Number: 133 Peachtree Street NE

City: Atlanta **State:** GA **Zip:** 30303

Telephone Number: 404-652-6907 **E-mail Address:** jim.brody@gapac.com

Plant Contact Information

4. Plant Contact: Joe Gorski **Title:** Lumber Division Environmental Manager

Telephone Number: 404-652-6455 **E-mail Address:** joe.gorski@gapac.com

5. Location Coordinates:

UTM 587400 **E-W** 3700970 **N-S**

Latitude/Longitude 33.444579° **LAT** -86.059666° **LONG**

6. **Permit application is made for:**

- [ ] Existing source (initial application)
- [ ] Modification
- [x] New source (to be constructed)
- [ ] Change of ownership
- [ ] Change of location
- [ ] Other (specify) ______

Existing source (permit renewal)

If application is being made to construct or modify, please provide the name and address of installer or contractor

______

______

______ **Telephone** ______

Date construction/modification to begin 12/1/2017 **to be completed** TBD

7. **Permit application is being made to obtain the following type permit:**

- [x] Air permit
- [ ] Major source operating permit
- [ ] Synthetic minor source operating permit
- [ ] General permit

8. **Indicate the number of each of the following forms attached and made a part of this application: (if a form does not apply to your operation indicate "N/A" in the space opposite the form). Multiple forms may be used as required.**

______	**ADEM 104 - INDIRECT HEATING EQUIPMENT**
4	**ADEM 105 - MANUFACTURING OR PROCESSING OPERATION**
______	**ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION**
1	**ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES**
______	**ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS**
______	**ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES**
2	**ADEM 110 - AIR POLLUTION CONTROL DEVICE**
______	**ADEM 112 - SOLVENT METAL CLEANING**
______	**ADEM 438 - CONTINUOUS EMISSION MONITORS**
______	**ADEM 437 - COMPLIANCE SCHEDULE**

9. **General nature of business: (describe and list appropriate standard industrial classification (SIC) and North American Industry Classification System (NAICS) (www.naics.com) code(s)):**

The facility will install and operate a softwood sawmill to produce dimensional lumber, NAICS 321113-Sawmills and SIC 2421 - Sawmills and Planing Mills, General. The mill will consist of a sawmill, three natural gas fired continuous lumber drying kilns, a planer mill, and ancillary support equipment.

10. **For those making application for a synthetic minor or major source operating permit, please summarize each pollutant emitted and the emission rate for the pollutant. Indicate those pollutants for which the facility is major.**

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
PM**	23.75**	No**
PM10	14.48	No
PM2.5	9.49	No
SO2**	0.41**	No**
VOC***	878.87	Yes
CO	40.10	No
NOx	31.19	No
Total HAPs (see emission summary section for speciated HAPs)	54.70	Yes
Methanol (included in Total HAPs)	40.10	Yes
Lead	2.36E-04	No
**PM and SO2 are represented as the requested PM and SO2 limits to avoid		
being major for these pollutants using the maximum allowable emission rates		
in accordance with the Alabama regulations. See the emission calculations		
section for comparison between maximum allowable and maximum potential		
emission rates.		
***VOC emissions are represented as VOC as WWP1 for the		
Continuous Drying Kilns, VOC as TOC for the Fire Pump Engine, and		
VOC as C for the Large Storage Tanks and Storage Tanks < 1,000 gallons.		

***Potential emissions are either the maximum allowed by the regulations or by permit, or, if there is no regulatory limit, it is the emissions that occur from continuous operation at maximum capacity.**

11. **For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.**

Emission unit or source: Sawmill and Green End Operations

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
LD	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
LB	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
SM	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CHC	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
BC	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CC	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CP	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
SDC	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
RD	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

11. **<u>For those applying for a major source operating permit</u>, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.**

Emission unit or source: Continuous Drying Kilns
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	Compliance Status OUT[3]
CDK-1	VOC	40 CFR Part 52	PSD	Production Recordkeeping, Operation/Maint. Plan	Proposed	N/A
CDK-2	VOC	40 CFR Part 52	PSD	Production Recordkeeping, Operation/Maint. Plan	Proposed	N/A
CDK-3	VOC	40 CFR Part 52	PSD	Production Recordkeeping, Operation/Maint. Plan	Proposed	N/A
CDK-1	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CDK-2	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CDK-3	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
CDK-1	HAP	40 CFR Part 63 Sub DDDD	NESHAP - PWCP MACT	Notification; Completed by Permit Application	Yes	N/A
CDK-2	HAP	40 CFR Part 63 Sub DDDD	NESHAP - PWCP MACT	Notification; Completed by Permit Application	Yes	N/A
CDK-3	HAP	40 CFR Part 63 Sub DDDD	NESHAP - PWCP MACT	Notification; Completed by Permit Application	Yes	N/A
CDK-1	SO2	ADEM Code 335-3-5-.01	SIP Regulation	Production Recordkeeping	Proposed	N/A
CDK-2	SO2	ADEM Code 335-3-5-.01	SIP Regulation	Production Recordkeeping	Proposed	N/A

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

11. **For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.**

Emission unit or source: Continuous Drying Kilns (cont.)

(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CDK-3	SO2	ADEM Code 335-3-5-.01	SIP Regulation	Production Recordkeeping	Proposed	N/A

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: Fire Pump Engine
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	Compliance Status OUT[3]
FE	VOC	40 CFR Part 52	PSD	Records of operating hours and maintenance	Proposed	N/A
FE	PM	ADEM Code 335-3-16	SIP Regulation	Records of operating hours and maintenance	Proposed	N/A
FE	SO2	ADEM Code 335-3-5-.01	SIP Regulation	Records of operating hours and maintenance	Proposed	N/A

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: Planer Mill and Finished End Operations
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
PM	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A
SC	PM	ADEM Code 335-3-4-.04(5)	SIP Regulation	Production Recordkeeping	Proposed	N/A

[1]PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-437)

[4]Fugitive emissions must be included as separate entries

11. For those applying for a major source operating permit, indicate the compliance status by program for each emission unit or source and the method used to determine compliance. Also cite the specific applicable requirement.

Emission unit or source: Large Storage Tanks
(description)

Emission Point No.	Pollutant[4]	Standard	Program[1]	Method used to determine compliance	Compliance Status IN[2]	Compliance Status OUT[3]
LST-1	VOC	40 CFR Part 52	PSD	Light color tank	Proposed	N/A
LST-2	VOC	40 CFR Part 52	PSD	Light color tank	Proposed	N/A
LST-3	VOC	40 CFR Part 52	PSD	Light color tank	Proposed	N/A

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)),SIP regulation, Title IV, Enhanced Monitoring, Title VI, Other (specify)

[2] Attach compliance plan

[3] Attach compliance schedule (ADEM Form-437)

[4] Fugitive emissions must be included as separate entries

12. **List all insignificant activities and the basis for listing them as such (i.e., less than the insignificant activity thresholds or on the list of insignificant activities). Attach any documentation needed, such as calculations. No unit subject to an NSPS, NESHAP or MACT standard can be listed as insignificant.**

Insignificant Activity	Basis
Log Process Debarker (LD)*	Unit qualifies as Section 2 Insignificant Activity
Log Bucking (LB)*	Unit qualifies as Section 2 Insignificant Activity
Fire Pump Diesel Tank	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Motor Oil Tank 1	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Motor Oil Tank 2	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Motor Oil Tank 3	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Hydraulic Tank	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Transmission Oil	Unit qualifies as Section 1 Trivial Activity
Mobile Shop Used Oil Tank	Unit qualifies as Section 1 Trivial Activity
Wet Deck Pond Skimmer Used Oil Tank	Unit qualifies as Section 1 Trivial Activity
Lubrication Building Small Hydraulic Tank	Unit qualifies as Section 1 Trivial Activity
* These insignificant sources are also contained in the ADEM 105 Form for the	
Sawmill and Green End Operation source group.	

13. List and explain any exemptions from applicable requirements the facility is claiming:

a. No exemptions requested, however, more stringent industry-specific PM and SO2 limits

b. are requested in lieu of PWR and fuel combustion maximum allowable limits. See the

c. Regulatory Applicability section for more details.

d.

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14. List below other attachments that are a part of this application(all supporting engineering calculations must be appended):

a. Executive Summary, Facility and Project Description, Emission Calculations, Regulatory Applicability,

b. Best Available Control Technology, Additional Impact, Ozone Review, and Class I Area Review, Appendix A - Facility Map and Process

c. Flow Diagram, Appendix B - Emission Calculations, Appendix C - BACT Supporting Documentation, Appendix D - Permit

d. Application Forms, Appendix E - Fugitive Emission Control Analysis, Appendix F - Proposed Monitoring and Recordkeeping

e.

f.

g.

h.

i.

I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.

I ALSO CERTIFY THAT THE SOURCE WILL CONTINUE TO COMPLY WITH APPLICABLE REQUIREMENTS FOR WHICH IT IS IN COMPLIANCE, AND THAT THE SOURCE WILL, IN A TIMELY MANNER, MEET ALL APPLICABLE REQUIREMENTS THAT WILL BECOME EFFECTIVE DURING THE PERMIT TERM AND SUBMIT A DETAILED SCHEDULE, IF NEEDED FOR MEETING THE REQUIREMENTS.

Jim Brody	Vice President of Operations	9/15/17
SIGNATURE OF RESPONSIBLE OFFICIAL	**TITLE**	**DATE**

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
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1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

   Operating scenario number 1

   Incoming logs will be typically stored on-site prior to processing. Logs are debarked (LD) and then cut to length within the log bucking process (LB) before being routed through the sawmill (SM). The end product of this process is rough, green dimensional lumber, some of which will be sold without further processing. By-products from this operation include bark, chips, and sawdust which are conveyed and stored in various locations prior to being shipped off site.

   Bark from the debarker will be conveyed to the bark hog and then to a bark storage bin before being shipped offsite (BC). Chip conveyance (CC) includes chips from the sawmill to the sawmill chipper/screen, from the chipper to rail car, through the chip cyclone (CHC) to the chip storage bin, or to the chip pile (CP) for storage prior to conveyance to the chip storage bin. The chip cyclone, as process equipment, pneumatically conveys chips. Sawdust is conveyed (SDC) from the sawmill and sawmill chipper/ screen to the sawdust storage bin. Haul Roads (RD) are utilized for shipments off site.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sawmill and Green End Operations (i.e. Log Debarker, Log Bucking, Sawmill, Chip Conveyance, Bark Conveyance, Chip Cyclone, Chip Pile and Sawdust Conveyance, Roads)

   Make: NA **Model:** NA

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 8,000 CFM (cyclone) 656,000 lb/hr

   Manufactured date: TBD Upon Approval **Proposed installation date:** 12/1/2017

   Original installation date (if existing): NA

   Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

   Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

   Peak production season (if any): NA

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Raw Logs		656,000	1,351,360

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Green Lumber	329.6	MMBf/yr
Chips	374,096	ton/yr
Bark	121,952	ton/yr
Sawdust	116,019	ton/yr

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

It is requested that the particulate matter (PM) emission limitations for this source be based on industry specific emission factors provided in this application in lieu of using the ADEM general industry process weight rule (PWR) to derive emissions. Compliance is proposed to be demonstrated by tracking total green lumber production. The design throughput through the Sawmill and Green End Operations, of 329.2 MMBf/year in total, demonstrates compliance with the emission rates provided.

9. Is there any emission control equipment on this emission source?

☒ **Yes** ☐ **No (Where a control device exists, Form ADEM-110 must be completed and attached).**

*Form ADEM-110 has been attached for CHC in the event that ADEM would require it. However, CHC is considered process equipment.

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Stack Diameter (Feet)	Stack Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
LD	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
LB	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
SM	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
CC	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
BC	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
CP	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
SDC	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
RD	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
CHC	TBD	600*	TBD	TBD	est. 8,000	Ambient
		*site to be leveled				

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
LD	PM	0.66	1.35	EPA Fire Database	29.33	E = 17.31P^0.16 ADEM 335-3-4-.03-4
LD	PM10	0.36	0.74	EPA Fire Database	NA	
LD	PM2.5	0.02	0.05	NCASI factor	NA	
LB	PM	9.77	0.91	EPA Fire Database	14.75	E = 3.59P^0.62 ADEM 335-3-4-.03-4
LB	PM10	3.52	0.33	EPA Fire Database	NA	
LB	PM2.5	1.07	0.10	EPA PMCALC Database	NA	
SM	PM	0.84	1.71	EPA Fire Database	28.44	E = 3.59P^0.62 ADEM 335-3-4-.03-4
SM	PM10	0.30	0.62	EPA Fire Database	NA	
SM	PM2.5	0.09	0.19	EPA PMCALC Database	NA	

Table Continued on Next Page

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

☐ **(Check box if extra pages are attached)**
Process flow diagram

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
CC	PM	0.58	1.20	AP42 factor	35.61	E = 17.31P^0.16 ADEM 335-3-4-.04
CC	PM10	0.28	0.57	AP42 factor	NA	
CC	PM2.5	0.04	0.09	AP42 factor	NA	
BC	PM	0.14	0.28	AP42 factor	29.33	E = 3.59P^0.62 ADEM 335-3-4-.04
BC	PM10	0.06	0.13	AP42 factor	NA	
BC	PM2.5	0.01	0.02	AP42 factor	NA	
SDC	PM	0.13	0.27	AP42 factor	28.44	E = 17.31P^0.16 ADEM 335-3-4-.04
SDC	PM10	0.06	0.13	AP42 factor	NA	
SDC	PM2.5	0.01	0.02	AP42 factor	NA	

Table Continued on Next Page

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

☐ **(Check box if extra pages are attached)**
Process flow diagram

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
CP	PM	1.50E-06	6.57E-06	AP42 factor	14.10	E = 3.59P^0.62 ADEM 335-3-4-.04
CP	PM10	8.70E-07	3.81E-06	EPA PMCALC Database	NA	
CP	PM2.5	2.85E-07	1.25E-06	EPA PMCALC Database	NA	
RD	PM	5.11	10.23	AP42 factor	49.04	E = 17.31P^0.16 ADEM 335-3-4-.04
RD	PM10	1.01	2.01	AP42 factor	NA	
RD	PM2.5	0.20	0.41	AP42 factor	NA	
CHC	PM	0.69	3.00	Vendor data	35.61	E = 17.31P^0.16 ADEM 335-3-4-.04
CHC	PM10	0.34	1.49	Vendor data	NA	
CHC	PM2.5	0.04	0.19	Vendor data	NA	

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

[X] **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

[X] Yes   [ ] No

(If "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

[X] Yes   [ ] No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

[X] Yes   [ ] No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
Bark	NA	NA	Storage Bin (BC)
Sawdust	NA	NA	Storage Bin (SDC)
Chips	NA	NA	Chip Pile (CP)
Chips (cont.)	NA	NA	Chip Storage Bin (CC)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 9/14/2017

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

   Operating scenario number 1

   The rough, green lumber is sorted and stacked before being dried in a continuous lumber drying kiln. Three kilns (CDK-1, CDK-2 and CDK-3) direct-fired with natural gas, are proposed at the facility. CDK-1 will have a maximum capacity 120 MMBf/yr and is equipped with a 40 MMBtu/hr natural gas-fired burner. After drying, the rough lumber will be processed in the planer mill.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** A natural gas fired Continous Dry Kiln (CDK-1) equipped with a 40 MMBtu burner

   Make: ______ **Model:** ______

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: See item 5

   Manufactured date: TBD Upon Approval **Proposed installation date:** 12/1/2017

   Original installation date (if existing): NA

   Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

   Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

   Peak production season (if any): NA

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Natural Gas (CDK-1)		39.2 MCF/hr	343,530 MCF/hr
Rough Green Lumber (CDK-1)		20.0 MBf/hr	120,000 MBf/yr

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1020	Btu/ft³	<0.0005	NA	NA	NA
L. P. Gas		Btu/ft³				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Dried Lumber	320,000*	MBf/yr

*The facility is requesting a production bubble containing all three kilns (CDK-1, CDK-2 and CDK-3).

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

Proper maintenance and operation is required as BACT for the continuous lumber kiln. See the BACT analysis for more information.

It is requested that the particulate matter (PM) and sulfur dioxide (SO2) emission limitations for this source be based on industry specific emission factors provided in this application in lieu of using the ADEM general industry process weight rule (PWR) to derive PM emissions and fuel combustion emission limitations for SO2. The design throughput of kiln dried lumber, not to exceed 320 MMBf/year in total for the mill, demonstrates compliance with the emission estimates for the unit.

9. Is there any emission control equipment on this emission source?

☐ Yes ☒ No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Stack Diameter (Feet)	Stack Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
CDK-1 (North Stack)	38	600*	2	106.1	20,000	110
CDK-1 (South Stack)	38	600*	2	106.1	20,000	110
CDK-1 (North Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
CDK-1 (South Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
		*site to be leveled				

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
CDK-1	VOC as C/ VOC as WPP1	85.6/109.8	256.8/329.4	Stack Test	NA	
CDK-1	PM	0.33	1.11	NCDENR & AP42 factors	32.19	E = 17.31P^0.16 ADEM 335-3-4-.04
CDK-1	PM10	0.74	2.63	NCDENR & AP42 factors	NA	
CDK-1	PM2.5	0.74	2.63	NCDENR & AP42 factors	NA	
CDK-1	SO2	0.02	0.10	AP42 Factor	160.0	4.0 lb/MMBtu ADEM 335-3-5-.01
CDK-1	CO	3.29	14.43	AP42 Factor	NA	
CDK-1	NOx	2.43	10.64	EPA Method 19	NA	
CDK-1	Lead	0.0000196	0.000086	AP42 Factor	NA	
CDK-1	HAPs (see attached emission summary for HAP breakdown)	6.80	20.50	NCDENR & AP42 factors	NA	

* Table continued on next page

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

[X] **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

[X] Yes [ ] No

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

[ ] Yes [X] No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

[ ] Yes [X] No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 10/04/2017

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

   Operating scenario number 1

   The rough, green lumber is sorted and stacked before being dried in a continuous lumber drying kiln. Three kilns (CDK-1, CKD-2 and CDK-3) direct-fired with natural gas, are proposed at the facility. CDK-2 will have a maximum capacity 120 MMBf/yr and is equipped with a 40 MMBtu/hr natural gas-fired burner. After drying, the rough lumber will be processed in the planer mill.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** A natural gas fired Continous Dry Kiln (CDK-2) equipped with a 40 MMBtu burner

   Make: **Model:**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: See item 5

   Manufactured date: TBD Upon Approval **Proposed installation date:** 12/1/2017

   Original installation date (if existing): NA

   Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

   Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

   Peak production season (if any): NA

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Natural Gas (CDK-2)		39.2 MCF/hr	343,530 MCF/hr
Rough Green Lumber (CDK-2)		20.0 MBf/hr	120,000 MBf/yr

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1020	Btu/ft³	<0.0005	NA	NA	NA
L. P. Gas		Btu/ft³				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Dried Lumber	320,000*	MBf/yr

*The facility is requesting a production bubble containing all three kilns (CDK-1, CDK-2 and CKD-3).

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

Proper maintenance and operation is required as BACT for the continuous lumber kiln. See the BACT analysis for more information. It is requested that the particulate matter (PM) and sulfur dioxide (SO2) emission limitations for this source be based on industry specific emission factors provided in this application in lieu of using the ADEM general industry process weight rule (PWR) to derive PM emissions and fuel combustion emission limitations for SO2. The design throughput of kiln dried lumber, not to exceed 320 MMBf/year in total for the mill, demonstrates compliance with the emission estimates for the unit.

9. Is there any emission control equipment on this emission source?

☐ Yes ☒ No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Stack Diameter (Feet)	Stack Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
CDK-2 (North Stack)	38	600*	2	106.1	20,000	110
CDK-2 (South Stack)	38	600*	2	106.1	20,000	110
CDK-2 (North Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
CDK-2 (South Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
		*site to be leveled				

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
CDK-2	VOC as C/ VOC as WPP1	85.6/109.8	256.8/329.4	Stack Test	NA	
CDK-2	PM	0.33	1.11	NCDENR & AP42 factors	32.19	E = 17.31P^0.16 ADEM 335-3-4-.04
CDK-2	PM10	0.74	2.63	NCDENR & AP42 factors	NA	
CDK-2	PM2.5	0.74	2.63	NCDENR & AP42 factors	NA	
CDK-2	SO2	0.02	0.10	AP42 Factor	160.0	4.0 lb/MMBtu ADEM 335-3-5-.01
CDK-2	CO	3.29	14.43	AP42 Factor	NA	
CDK-2	NOx	2.42	10.64	EPA Method 19	NA	
CDK-2	Lead	0.0000196	0.000086	AP42 Factor	NA	
CDK-2	HAPs (see attached emission summary for HAP breakdown)	6.80	20.50	NCDENR & AP42 factors	NA	

* Table continued on next page

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

[X] **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

[X] Yes [ ] No

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

[ ] Yes [X] No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

[ ] Yes [X] No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed Date: 10/04/2017

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

| | | | - | | | | | - | | | | |

Do not write in this space

1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

   Operating scenario number 1

   The rough, green lumber is sorted and stacked before being dried in a continuous lumber drying kiln. Three kilns (CDK-1, CDK-2 and CDK-3) direct-fired with natural gas, are proposed at the facility. CDK-3 will have a maximum capacity of 80 MMBf/yr and is equipped with a 30 MMBtu/hr natural gas-fired burner. After drying, the rough lumber will be processed in the planer mill.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** A natural gas fired Continous Dry Kiln (CDK-3) equipped with a 30 MMBtu burner

   Make: **Model:**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: See item 5

   Manufactured date: TBD Upon Approval **Proposed installation date:** 12/1/2017

   Original installation date (if existing): NA

   Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

   Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

   Peak production season (if any): NA

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Natural Gas (CDK-3)		29.4 MCF/hr	257,648 MCF/hr
Rough Green Lumber (CDK-3)		13.2 MBf/hr	80,000 MBf/yr

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1020	Btu/ft³	<0.0005	NA	NA	NA
L. P. Gas		Btu/ft³				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
Dried Lumber	320,000*	MBf/yr

*The facility is requesting a production bubble containing all three kilns (CDK-1, CDK-2 and CDK-3).

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

Proper maintenance and operation is required as BACT for the continuous lumber kiln. See the BACT analysis for more information. It is requested that the particulate matter (PM) and sulfur dioxide (SO_2) emission limitations for this source be based on industry specific emission factors provided in this application in lieu of using the ADEM general industry process weight rule (PWR) to derive PM emissions and fuel combustion emission limitations for SO_2. The design throughput of kiln dried lumber, not to exceed 320 MMBf/year in total for the mill, demonstrates compliance with the emission estimates for the unit.

9. **Is there any emission control equipment on this emission source?**

☐ Yes ☒ No **(Where a control device exists, Form ADEM-110 must be completed and attached).**

10. **Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):**

Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Stack Diameter (Feet)	Stack Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
CDK-3 (North Stack)	38	600*	2	106.1	15,000	110
CDK-3 (South Stack)	38	600*	2	106.1	15,000	110
CDK-3 (North Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
CDK-3 (South Door)	N/A-Fugitive	600*	N/A-Fugitive	N/A-Fugitive	N/A-Fugitive	110
		*site to be leveled				

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
CDK-3	VOC as C/VOC as WPP1	56.5/72.47	171.2/219.6	Stack Test	NA	
CDK-3	PM	0.23	0.76	NCDENR & AP42 factors	30.12	E = 17.31P^0.16 ADEM 335-3-4-.0.4
CDK-3	PM10	0.51	1.86	NCDENR & AP42 factors	NA	
CDK-3	PM2.5	0.51	1.86	NCDENR & AP42 factors	NA	
CDK-3	SO2	0.02	0.08	AP42 Factor	120.0	4.0 lb/MMBtu ADEM 335-3-5-.01
CDK-3	CO	2.47	10.82	AP42 Factor	NA	
CDK-3	NOx	1.82	7.98	EPA Method 19	NA	
CDK-3	Lead	0.0000147	0.0000644	AP42 Factor	NA	
CDK-3	HAPs (see attached emission summary for HAP breakdown)	4.49	13.69	NCDENR & AP42 factors	NA	

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

[X] **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

[X] Yes [ ] No

(if "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

[ ] Yes [X] No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

[ ] Yes [X] No

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed Date: 10/04/2017

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-						

Do not write in this space

1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

Operating scenario number 1

The facility has a 2,000 gallon gasoline tank (LST-1), 6,000 gallon diesel tank (LST-2), and a 6,000 gallon lube oil tank (LST-3) to support operations. There are also other trivial storage tanks on site, listed on Form 103.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Large storage tanks (LST-1, LST-2, LST-3)

Make: N/A **Model:** N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: N/A

Manufactured date: TBD Upon Approval **Proposed installation date:**

Original installation date (if existing):

Reconstruction or Modification date (if applicable):

4. **Normal operating schedule:**

Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

Peak production season (if any): N/A

5. **Materials (feed input) used in unit or process (include solid fuel materials used, if any):**

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Gasoline	2.32 gal/hr	1,690 gal/hr	20,280 gal/yr
Diesel	7.98 gal/hr	5,828 gal/hr	69,936 gal/yr
Lube Oil	1.33 gal/hr	5,828 gal/hr	11,656 gal/yr

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr**

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

7. **Products of process or unit:**

Products	Quantity/year	Units of production
N/A		

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):**

9. Is there any emission control equipment on this emission source?

☐ Yes ☒ No (Where a control device exists, Form ADEM-110 must be completed and attached).

10. Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):

	Stack					
Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)

* Std temperature is 68°F - Std pressure is 29.92" in Hg.

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
LST - 1	VOC	21.18	0.31	AP-42	N/A	N/A
LST - 2	VOC	0.14	0.0013	AP-42	N/A	N/A
LST - 3	VOC	0.14	0.0007	AP-42	N/A	N/A

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

☐ **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

[X] Yes [ ] No

(If "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

[ ] Yes [X] No

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

[ ] Yes [ ] No N/A

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed Date: 9/14/2017

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of firm or organization:** Talladega Sawmill

2. **Briefly describe the operation of this unit or process in your facility: (separate forms are to be submitted for each type of process or for multiple units of one process type. If the unit or process receives input material from, or provides input material to, another operation, please indicate the relationship between the operations.) An application should be completed for each alternative operating scenario.**

   Operating scenario number 1

   The rough, dry lumber is finished in the planer mill. Planer shavings and planer hog trim are conveyed to the shavings storage bin. A cyclofilter (PM) is used for particulate control of the pneumatically conveyed shavings (SC).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Planer Mill and Finished End Operations (i.e. Planer Mill with Cyclofilter and Shaving Conveyance)

   Make: ______ **Model:** ______

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 105 MBf/hr

   Manufactured date: TBD Upon Approval **Proposed installation date:** 12/1/2017

   Original installation date (if existing): NA

   Reconstruction or Modification date (if applicable): NA

4. **Normal operating schedule:**

   Hours per day: 24 **Days per week:** 7 **Weeks per year:** 52

   Peak production season (if any): NA

5. Materials (feed input) used in unit or process (include solid fuel materials used, if any):

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Dried Lumber		105 MBf/hr	320 MMBf/yr

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on Form ADEM-104):__________MMBtu/hr

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Dried Finished Lumber	320	MMBf/yr
Shavings	64,000	ton/yr

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):

It is requested that the particulate matter (PM) emission limitations for this source be based on industry specific emission factors provided in this application in lieu of using the ADEM general industry process weight rule (PWR) to derive emissions. Finished dry lumber produced in the planer mill will be recorded to demonstrate compliance with the Planer Mill and Finish End Operations emission rates.

9. **Is there any emission control equipment on this emission source?**

☒ Yes ☐ No **(Where a control device exists, Form ADEM-110 must be completed and attached).**

*Form ADEM-110 has been attached for PM in the event that ADEM would require it. However, PM is considered process equipment.

10. **Air contaminant emission points: (Each point of emission should be listed separately and numbered so that it can be located on the attached flow diagram):**

Emission Point	Height Above Grade (Feet)	Base Elevation (Feet)	Stack Diameter (Feet)	Stack Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
PM	TBD	600*	TBD	TBD	TBD	Ambient
SC	Fugitive-NA	600*	Fugitive-NA	Fugitive-NA	Fugitive- NA	Ambient
		*site to be leveled				

*** Std temperature is 68°F - Std pressure is 29.92" in Hg.**

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions <u>must be included</u> and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
PM	PM	0.37	1.61	Vendor guarantee	15.55	E = 3.59P^0.62 ADEM 335-3-4-.04
PM	PM10	0.27	1.17	Vendor guarantee for PM	NA	
PM	PM2.5	0.27	1.17	Vendor guarantee for PM	NA	
SC	PM	0.02	0.06	AP42 factor	15.55	E = 3.59P^0.62 ADEM 335-3-4-.04
SC	PM10	0.01	0.03	AP42 factor	NA	
SC	PM2.5	0.001	0.004	AP42 factor	NA	

12. **Using a flow diagram:**

(1) **Illustrate input of raw materials,**

(2) **Label production processes, process fuel combustion, process equipment and air pollution control equipment,**

(3) **Illustrate locations of air contaminant release so that emission points under item 10 can be identified.**

[X] **(Check box if extra pages are attached)**
Process flow diagram

13. Is this unit or process in compliance with all applicable air pollution rules and regulations?

☒ **Yes** ☐ **No**

(If "no", a compliance schedule, Form ADEM-437 must be completed and attached.)

14. Does the input material or product from this process or unit contain finely divided materials which could become airborne?

☒ **Yes** ☐ **No**

15. If "yes", is this material stored in piles or in some other facility as to make possible the creation of fugitive dust problems?

☒ **Yes** ☐ **No**

List storage piles or other facility (if any):

Type of material	Particle size (diameter or screen size)	Pile size or facility (average tons)	Methods utilized to control fugitive emissions (wetted, covered, etc.)
Shavings	NA	NA	Storage Bin (SC)

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 9/14/2017

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

☐☐☐ – ☐☐☐☐ – ☐☐☐☐

Permit Number (ADEM Use Only)

1. Facility Name: Talladega Sawmill **Location:** Talladega, Alabama (Talladega County)

2. Purpose of Application:

- ☐ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☒ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ☐ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe: Engine is already installed on-site

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: ________

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility: ________

3. Engine Identification:

A. Manufacturer's Name: Cummins B. Model Number: 60522251 C. Model Year: 1984

D. Facility's Identification Number or Description: Fire Pump Engine E. Serial Number: ________

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: ________ B. Date Manufactured: 1984 C. Date Modified/Reconstructed: ________

D. For a used engine, approximate date engine was first placed into service at any location: 2005

5. Engine Function: ☐ Compression ☐ Electrical Generation (Maximum Electrical Output: ________) ☒ Fire Pump Driver ☐ Other Pump Driver ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe: ________

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in Items A-D below: ☐ Limited Use (<100 hr/yr)

A. Hours Per Day: ________ B. Days Per Week: ________ C. Weeks per Year: ________

D. Peak Season (if any): ________

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 250 B. Maximum Engine Power (kWm): ________ C. Maximum Heat Input (MMBtu/hr): ________

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☐ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☐ 4-Stroke RICE ☒ N/A ☐ Other: ________

F. Air/Fuel Mix: ☐ Rich Burn RICE ☐ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other: ________

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): ________

8. Fuel Information:

	Fuel Type/Description	Sulfur Content (indicate % by weight OR ppm)	Fuel-bound Nitrogen Content (indicate % by weight OR ppm)	Percent (%) of Gross Heat Input on Annual Basis
Primary Fuel	No. 2 Diesel Fuel			
Secondary/Backup	N/A			

9. Stack Parameters (If a control device is installed, the information should be for the control device's stack exit):

A. Height above grade (feet): 15 B. Inside Diameter at Exit (feet): 1 C. Exhaust Gas Volume (ACFM): 1,500

D. Base Elevation (feet): 601 E. Exhaust Gas Temperature°F): 1,000 F. Are sampling ports available? ◯ Yes ☒ No

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
NOx	7.75	1.94			AP-42	
CO	1.67	0.42			AP-42	
VOC	0.63	0.16			BACT	
PM	0.55	0.14			AP-42	
SO_2	0.51	0.13			AP-42	
Formaldehyde	2.66E-03	6.64E-04			AP-42	
Total HAP	8.40E-03	2.10E-03			AP-42	

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: ________
- ☐ Other: ________

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
BACT - VOC	2.51E-03	lb/hp-hr	335-3-14-.04	2.51E-03 lb/hp-hr
Work Practice Standards			§63.6602 Table 2c	

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards ? ☒ N/A ☐ No ☐ Yes (If yes, attach a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? ☐ N/A ☐ No ☒ Yes

13. Pollution Control Information:

A. Device/Technology Type(s):

- [X] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NO_x Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [ ] Other: ______
- [ ] Other: ______
- [ ] Other: ______

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? (X) Yes ( ) No (If "No", must attach ADEM Form 437)

15. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Lisa Reed Company/Affiliation: GBMc & Associates

Signature: Lisa M. Reed Date: 9/14/2017

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION
FOR
AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of firm or organization** Talladega Sawmill

2. **Type of pollution control device: (If more than one, check each; however, separate forms are to be submitted for each specific device.)**

   - ☐ Settling chamber
   - ☐ Electrostatic precipitator
   - ☐ Afterburner
   - ☒ Baghouse
   - ☒ Cyclone
   - ☐ Multiclone
   - ☐ Absorber
   - ☐ Adsorber
   - ☐ Condenser
   - ☐ Wet Suppression

   Wet scrubber (kind):

   Stage 1 - Vapor balance (type):

   Other (describe): Cyclofilter is a combined cyclone and baghouse.

3. **Control device manufacturer's information:**

   Name of manufacturer Rodrigue Metal LTEE **Model No.** Cyclofilter CF-12.5

4. **Emission source to which device is installed or is to be installed:**

   Planer Mill and Green End

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	574.75 lb/hr	57.47 lb/hr	57.47 lb/hr
Designed	0.37 lb/hr	0.27 lb/hr	0.27 lb/hr
Manufacturer's guaranteed			
Mass emission rate (Expressed as units of standard)			
Required by regulation	15.6 lb/hr	NA	NA
Manufacturer's guaranteed			
Removal efficiency (%)			
Designed	99.95	99.90	99.00
Manufacturer's guaranteed			

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	est. 70,600		est. 70,600
(ACFM, existing conditions)	-		-
Temperature (°F)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	Ambient		Ambient

Pressure drop across TBD **(inches H_2O)**

7. **Stack dimensions:**

Height above grade.. TBD **(feet)**

Inside diameter at exit (if opening is round)................ TBD **(feet)**

Inside area at exit (if opening is not round) .... TBD **(sq. feet)**

Base Elevation .... 600 **(feet)**

GEP Stack Height.. TBD **(feet)**

8. **Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.**

See process flow diagram section of the application.

9. **Enclosed are:**

- ☐ **Blueprints**
- ☐ **Manufacturer's literature**
- ☐ **Emissions test of existing installation**
- ☒ **Other** See Appendix B for cyclofilter manufacturer specifications and control efficiency chart.
- ☐ **Particle size distribution report**
- ☐ **Size-efficiency curves**
- ☐ **Fan curves**

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

TBD - equipment has not yet been selected and information will be made available as soon as able.

12. By-pass (if any) is to be used when:

TBD

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	64,000 tpy			
Composition	Shavings			
Is waste hazardous?	No			
Method of disposal	Shavings storage bin			
Final destination	Byproduct, sold offsite			

If collected air pollutants are recycled, describe:

NA

Name of person preparing application Lisa Reed, GBMc & Associates

Signature Lisa M. Reed **Date** 9/14/2017

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of firm or organization** Talladega Sawmill

2. **Type of pollution control device: (If more than one, check each; however, separate forms are to be submitted for each specific device.)**

- ☐ Settling chamber
- ☐ Electrostatic precipitator
- ☐ Afterburner
- ☐ Baghouse
- ☒ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe): Chip cyclone is used for transfer of chips.

3. **Control device manufacturer's information:**

Name of manufacturer TBD - equipment has not yet been selected and information will be made available as soon as able. **Model No.** TBD - equipment has not yet been selected and information will be made available as soon as able.

4. **Emission source to which device is installed or is to be installed:**

Sawmill and Green End Operations

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	NA	NA	NA
Designed	0.69 lb/hr	0.34 lb/hr	0.04 lb/hr
Manufacturer's guaranteed			
Mass emission rate (Expressed as units of standard)			
Required by regulation	35.61 lb/hr	NA	NA
Manufacturer's guaranteed			
Removal efficiency (%)			
Designed	NA	NA	NA
Manufacturer's guaranteed			

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	est. 8,000		est. 8,000
(ACFM, existing conditions)	-		-
Temperature (°F)	Ambient		Ambient
Velocity (ft/sec)	TBD		TBD
Percent moisture	Ambient		Ambient

Pressure drop across NA **(inches H_2O)**

7. **Stack dimensions:**

Height above grade .... TBD **(feet)**

Inside diameter at exit (if opening is round) .... TBD **(feet)**

Inside area at exit (if opening is <u>not</u> round) .... TBD **(sq. feet)**

Base Elevation .... 600 **(feet)**

GEP Stack Height .... TBD **(feet)**

8. **Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.**

See process flow diagram section of the application.

9. **Enclosed are:**

☐ **Blueprints** ☐ **Particle size distribution report**

☐ **Manufacturer's literature** ☐ **Size-efficiency curves**

☐ **Emissions test of existing installation** ☐ **Fan curves**

☐ **Other** Cyclone equipment has not yet been selected and information will be made available as soon as able.

10. **If the pollution control device is of unusual design, please provide a sketch of the device.**

11. **List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)**

Cyclone equipment has not yet been selected and information will be made available as soon as able.

12. **By-pass (if any) is to be used when:**

NA

13. **Disposal of collected air pollutants:**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	374,096 tpy			
Composition	Chips			
Is waste hazardous?	No			
Method of disposal	Chip storage bin			
Final destination	Byproduct, sold offsite			

If collected air pollutants are recycled, describe:

NA

Name of person preparing application Lisa Reed, GBMc & Associates

Signature Lisa M. Reed **Date** 9/14/2017

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of firm or organization: Talladega Sawmill

2. Unit Description (i.e. No. 1 Power Boiler): NA

Equipment manufacturer's information

Name of manufacturer: NA

Model number: NA

Rated capacity-input: NA (Btu/hr.)

Boiler type: ☐ Fire tube ☐ Water tube ☐ other(specify): ______

Manufactured date: ______

Proposed installation date: ______

Original installation date (if existing): ______

Reconstruction or Modification date (if applicable):

3. Type of fuel used:

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ____ % ☐Power generation ______ % ☐Process heat ____ %

Other (specify): ______________________________

5. Normal schedule of operation:

Hours per day: __________ Days per week: __________ Weeks per year: __________

6. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work

practice standard (attach additional page if necessary): ______________________________

____

____

7. Fugitive Emissions (attach calculation worksheets):

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

8. Is there any emission control equipment on this emission source?

☐Yes ☐No (If "yes", complete form ADEM-110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

10. **Stack data:**

Height above grade ____________ **(feet)** **Gas temperature at exit** ____________ **(°F)**

Inside diameter at exit ____________ **(feet)** **Volume of gas discharged** ____________ **(ACFM)**

Base Elevation ____________ **(feet)**

Are sampling ports available? ☐ **Yes** ☐ **No** **(If "yes", describe. Draw on separate sheet if necessary):**

11. **Is this item in compliance with all applicable air pollution rules and regulations?**

☐ **Yes** ☐ **No (if "no", a compliance schedule, form ADEM-114, must be attached.)**

Name of person preparing application: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 9/14/2017

NOT APPLICABLE

PERMIT APPLICATION
FOR
WASTE DISPOSAL

☐☐☐ -	☐☐☐☐ -	☐☐☐☐

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SECTION I

1. Name of firm or organization: Talladega Sawmill

2. Type and quantity of waste generated:

Type waste	Quantity - tons/yr	Disposal method code*
Paper		
Cardboard		
Wood		
Plastic		
Rubber		
Gaseous		
Liquid		
Pathological		
Incombustibles		
Garbage		
Other		

* method codes

(1) incineration

(2) company operated on-site disposal

(3) commercial disposal service

(4) hauled by source to separate disposal site

(5) sold or otherwise transferred to another source for reclaiming or recycling

(6) other (specify): ______

3. Do the methods used for disposing of waste comply with all applicable air pollution rules and regulations?

☐yes ☐no

(if "no", a compliance schedule, Form ADEM-114, must be completed and attached.)

SECTION II

If waste disposal is by incineration, please complete the following:

1. **Incinerator manufacturer's information:**

   a. **Name of manufacturer:** ______________________

   b. **Model number:** ______________________

   c. **Rated capacity (specify units):** ______________________

   d. **Check type of waste (see final page for definitions of waste types)**

   ☐Type 0 ☐Type 1 ☐Type 2 ☐Type 3 ☐Type 4 ☐Type 5 ☐Type 6 ☐Type 7

2. **Type of incinerator (check all applicable):**

   ☐Single chamber ☐Multiple chamber

   ☐Other (specify): ______________________

3. **Auxiliary equipment (check all applicable):**

   ☐Primary burner **Fuel:** ____________ **(type)**

   ☐Secondary burner **Fuel:** ____________ **(type)**

4. **Combustion air:**

   ☐Natural draft ☐Starved air ☐Induced draft ☐Forced draft

   ☐Other (specify): ______________________

5. **Have tests been performed on this model incinerator?**

   ☐yes ☐no **If yes, attach copy of report**

6. **Waste feed method:**

   ☐Fuel fed ☐Continuous direct ☐Chute fed ☐Batch direct

7. **Operating schedule (typical)**

Hours per day: **from:** ________ **(time)** **to:** ________ **(time)**

Days per week: ____________ **on:** **m** ☐ **t** ☐ **w** ☐ **t** ☐ **f** ☐ **s** ☐ **s** ☐

Weeks per year: ______________________

8. **For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional pages if necessary):** ____________________

____

____

9. **Fugitive Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
Volatile organic compounds					
Other					

10. **Is there any emission control equipment on the incinerator?**

☐ **yes** ☐ **no** **if "yes", complete Form ADEM-110**

11. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
Volatile organic compounds					
Other					

12. **Stack data:**

Height above grade ______ (feet) Gas temperature at exit ______ (°F)

Inside diameter at exit ______ (feet) Volume of gas discharged ______ (ACFM)

Base Elevation ______ (feet)

Are sampling ports available? ☐Yes ☐No (If "yes", describe. Draw on separate sheet if necessary)

13. **Is this item in compliance with all applicable air pollution rules and regulations?**

☐Yes ☐No (if "no", a compliance schedule, Form ADEM-114, must be attached.)

Name of person preparing application (PRINT or TYPE): Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 9/14/2017

NOT APPLICABLE

PERMIT APPLICATION
FOR
COMPLIANCE SCHEDULE

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1. **Name of firm or organization:** Talladega Sawmill

2. **Compliance schedule for:** NA

3. **Compliance schedule (include schedule of remedial measures leading to compliance) and schedule for submittal of progress reports (must be at least once every six months):**

   NA

4. **Describe method(s) to be used to determine compliance:** NA

5. **Date by which item will be in complete compliance with all applicable air pollution control rules and regulations:**

   month/day/year

Name of person preparing schedule: Lisa Reed, GBMc & Associates

Signature: Lisa M. Reed **Date:** 9/14/2017

NOT APPLICABLE

PROJECT INFORMATION SHEET

PROJECT NAME: Talladega Sawmill

PROJECT DESCRIPTION, INCLUDING NATURE OF PROJECT (i.e., New or Modified facility):
New Sawmill Facility

PROJECT LOCATION (i.e., STATE, COUNTY, NEAREST CITY; UTM COORDINATES):
440 Ironaton Cutoff Road, Talladega (Talladega County), Alabama 35160
UTM: 587400 E 3700970 N

LIST OF CLASS I AREAS WITHIN 100 KM OF THE PROPOSED SOURCE OR THOSE THAT THE PERMITTING AUTHORITY BELIEVES MAY BE IMPACTED BY A LARGE SOURCE WHICH IS BEYOND 100 KM. INCLUDE DISTANCE AND DIRECTION FROM THE CLASS I AREAS TO THE SOURCE:

No class I areas are within 100 km of the proposed facility and all associated sources.

PROPOSED EMISSION RATES AND/OR INCREASES:

EMISSIONS	lb/hr	TPY
SO_2	0.58	0.41
NO_X	14.43	31.19
PM	19.76	23.75
CO	10.73	40.10
VOC	314.40	878.87
Other (List)		
Other (List)		
Other (List)		

PROPOSED EMISSION CONTROL TECHNOLOGY AND PROPOSED REMPOVAL EFFICIENCY/EMISSION RATE (USING RBLC STANDARD UNITS, i.e., ppm, lb/MMBtu)

Proper Operation and Maintenance is proposed as BACT.

BRIEF SUMMARY OF ANY CLASS I ANALYSES CONTAINED IN THE APPLICATION (E.g., INCREMENT CONSUMPTION, VISIBILITY, DEPOSITION ANALYSES)
No class I areas are within 100 km of the proposed facility and all associated sources. See PSD Applicability Section for more information.

COMPANY CONTACT: Joe Gorski
MAILING ADDRESS:
440 Ironaton Cutoff Road, Talladega, Alabama 35160

TELEPHONE AND FAX NUMBERS: 404-652-6455

STATE CONTACT: **TIM OWEN, CHIEF, ENGINEERING BRANCH**
MAILING ADDRESS: **ADEM - AIR DIVISION**
P.O. BOX 301463
MONTGOMERY, AL 36130-1463

TELEPHONE AND FAX NUMBERS: **334/271-7861 (PHONE)**
334/279-3044 (FAX)

ADEM Form 445
8/02

APPENDIX E

FUGITIVE EMISSION CONTROL ANALYSIS

FUGITIVE EMISSION CONTROL ANALYSIS

The Talladega Sawmill proposes the following requirements to minimize fugitive emissions at the facility.

1) Particles generated from sawdust, chips, and bark from sawmill operations are relatively large and not respirable. Because of their large size, these particles also tend to settle out of the air quickly. Therefore, partially enclosed buildings are considered to be an industry standard control for particulate emitted from the process equipment. The proposed Sawmill and Green End Operations process equipment at the facility including the Log Processing Debarker (LD) and the Sawmill (SM) shall be partially enclosure as indicated in the emission calculations. Furthermore, water is applied to the sawmill saws while operating to reduce fugitive emissions. The Log Bucking (LB) process is enclosed by two walls and a roof, however, emissions are conservatively estimated with no control.
2) The Planer Mill and Finished End Operations process equipment are collected and the emissions and shavings from the Planer Mill are conveyed using a pneumatic collection system to the cyclofilter (PM). Therefore, it is assumed there are no fugitive emissions associated with the planer mill equipment. The large shaving particles are dropped out into the Shaving Storage Bin (SC) and then shipped off-site by trucks.
3) All sawmill byproduct (bark, chip, sawdust, and shavings) conveyance results in storage (BC, CC, SDC, and SC respectively) in bins and any chip overflow in a chip pile (CP). Fugitive particulate emissions will be minimized, watered as needed, and removed as necessary to reduce impact.
4) All sawdust and bark produced at the facility shall be conveyed by covered belts or drag chains to the storage bins (SDC and BC) to minimize fugitive particulate emissions.
5) The chip conveyance (CC) utilizes a cyclone for pneumatic conveyance to the storage bin.
6) The bark hog and sawmill chipper shall be completely enclosed to eliminate direct releases of fugitive emissions.
7) Some haul roads will be paved; unpaved roads will have speed limits posted and can be watered if fugitive emissions are problematic.

APPENDIX F

PROPOSED MONITORING AND RECORDKEEPING

PROPOSED MONITORING AND RECORDKEEPING

The Talladega Sawmill will demonstrate compliance for all process emission estimates through recordkeeping of lumber production. Records will be updated monthly and maintained on-site.

Emission Source Description	Emission Point ID	Proposed Compliance Requirements
Sawmill and Green End Operations	LD LB BC SM CHC CC CP SDC RD	Monthly recordkeeping of lumber produced (329,600 MBf/yr on a 12 month rolling average basis).
Continuous Drying Kilns	CDK-1 CDK-2 CDK-3	Monthly recordkeeping of lumber dried (320,000 MBf/yr on a 12 month rolling average basis) and records of proper operation and maintenance of the kilns. A maintenance and operating plan is proposed for ADEM review within 6 months of kiln startup.
Planer Mill and Finished End Operations	PM SC	Monthly recordkeeping of finished lumber produced (320,000 MBf/yr on a 12 month rolling average basis).
Emergency Fire Pump Engine	FE	Monthly recordkeeping of hours of operation. Records of maintenance performed.