

From: [Rachael Broadway](#)
To: [Meredith, Lester](#)
Cc: [Jeremiah Redman](#); [Crawford Jr., David](#)
Subject: RE: New South Lumber Company - PSD Application Revision
Date: Wednesday, March 25, 2026 1:46:04 PM
Attachments: [image006.png](#)
[image008.png](#)
[image001.png](#)

Hey Lester,

Please find the latest application attached. This copy has an updated PM compliance equation listed in Section 4.1 of the Application Narrative.

Thank you

.....
Rachael Broadway
Sr. Environmental Consultant

P 205.973.0659 M 334.730.5671
Email: Rachael.broadway@trinityconsultants.com
10 Inverness Center Parkway, Suite 130, Birmingham, AL 35242

Files attached to this message

Filename	Size	Checksum (SHA256)
NSLC - Bucks Sawmill PSD Application (2026 0325).pdf	28 MB	0b0f025f09cc3133e5e7cd4584e10ecdb4496bf45df4745e952911331e3552d1

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From: Meredith, Lester <VLM@adem.alabama.gov>
Sent: Wednesday, March 25, 2026 1:06 PM
To: Rachael Broadway <Rachael.Broadway@trinityconsultants.com>
Subject: RE: New South Lumber Company - PSD Application Revision

Ah I see now. The silos just got left out of the equation. Looks right now.

From: Rachael Broadway <Rachael.Broadway@trinityconsultants.com>
Sent: Wednesday, March 25, 2026 12:39 PM
To: Meredith, Lester <VLM@adem.alabama.gov>
Cc: Jeremiah Redman <jredman@trinityconsultants.com>; Crawford Jr., David <david.crawfordjr@canfor.com>
Subject: RE: New South Lumber Company - PSD Application Revision

Hey Lester,

I apologize for the oversight. I will provide the updated application. Please see the equation below with the adding the fuel silo cyclones. So for the double listing of ENG1, there is a listing for ENG1 which is the Emergency Diesel-Fired Fire Pump (X006) and GEN1 is for the Emergency Natural Gas-fired Generator (X007). These emission unit ID's are listed in Table 4-2.

Please let me know if this edit is sufficient. If so, I will provide another application update via electronic delivery.

An example of the proposed PM emission tracking is as follows:

Total PM2.5 (tpy)

$$\begin{aligned}
 &= \frac{CDK1\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK2\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \frac{CDK3\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK4\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \left[Abort\ Stack\ EF\ \left(\frac{ton}{yr}\right) \times Startup\ hours\ \left(\frac{hr}{yr}\right)\right] \\
 &+ \frac{Fuel\ Silo\ Cyclone\ 1\ EF\ \left(\frac{lb}{hr}\right) \times hr/yr}{2,000\ lb/ton} + \frac{Fuel\ Silo\ Cyclone\ 2\ EF\ \left(\frac{lb}{hr}\right) \times hr/yr}{2,000\ lb/ton} \\
 &+ \frac{Planer\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{ENG1\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} \\
 &+ \frac{GEN1\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} \\
 &+ \frac{GEN2\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} \\
 &+ \frac{GEN3\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton}
 \end{aligned}$$

Thank you

.....
Rachael Broadway
 Sr. Environmental Consultant

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 10 Inverness Center Parkway, Suite 130, Birmingham, AL 35242

From: Meredith, Lester <VLM@adem.alabama.gov>
Sent: Wednesday, March 25, 2026 10:04 AM
To: Rachael Broadway <Rachael.Broadway@trinityconsultants.com>
Subject: RE: New South Lumber Company - PSD Application Revision

This example equation in Section 4.1 does not include fuel silo cyclone emissions and lists ENG-1 twice.

An example of the proposed PM emission tracking is as follows:

Total PM2.5 (tpy)

$$\begin{aligned}
 &= \frac{CDK1\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK2\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \frac{CDK3\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK4\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \left[Abort\ Stack\ EF\ \left(\frac{ton}{yr}\right) \times Startup\ hours\ \left(\frac{hr}{yr}\right)\right] + \frac{Planer\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \frac{ENG1\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} + \frac{GEN1\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} \\
 &+ \frac{GEN2\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} + \frac{GEN3\ EF\ \left(\frac{lb}{hr}\right) \times Non - Emerg. Hours\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton}
 \end{aligned}$$

From: Rachael Broadway <Rachael.Broadway@trinityconsultants.com>
Sent: Tuesday, March 24, 2026 3:11 PM
To: Meredith, Lester <VLM@adem.alabama.gov>; Cole, Lisa B <LBCole@adem.alabama.gov>

Cc: Crawford Jr., David <david.crawfordjr@canfor.com>; Fisher, Chelsea <chelsea.fisher@canfor.com>; Jeremiah Redman <jredman@trinityconsultants.com>; Tony Jabon <TJabon@trinityconsultants.com>

Subject: New South Lumber Company - PSD Application Revision

Hello Lester,

Please find a link to the latest PSD Permit Application for New South Lumber Company in this email.

This revision is to address the removal of daily visible emission observations (VEO) from the continuous kilns. All mentions of the daily VEOs have been removed from Appendix G (Proposed Permit Conditions) and Appendix I (Kiln O&M Plans). A paragraph was added to Section 1 of the narrative outlining the justification for removing the daily VEO requirement. Please let me know if you have any questions or concerns about this revision.

Additionally, Canfor and Trinity request a meeting to discuss the draft air permits once completed and provided. Ideally, Canfor would receive and review the draft permits internally prior to any meeting. The meeting would allow for direct feedback regarding any issues that may be noted in the drafts. Would you be available to meet for this open discussion? Afternoons next week are best for our team.

Thank you very much for your attention to this matter. Again, if you have any questions, please free feel to contact our team.

Thank you

.....
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The banner features the Trinity Consultants logo on the left. It lists three courses: 'Air Quality Permitting in Alabama' (Mar 25, 2026, 8:00 AM - 5:00 PM), 'Navigating Compliance and Changes to your Alabama Title V Permit' (Mar 26, 2026, 8:00 AM - 12:00 PM), and 'Prevention of Significant Deterioration (PSD) Permitting Applicability and Avoidance Strategy in Alabama' (Mar 26, 2026, 1:00 - 5:00 PM). A location tag for 'Tuscaloosa, AL' is shown. On the right, there is a circular profile picture of Rachael Broadway, Senior Consultant, and a vertical 'EHS TRAINING' label. A registration offer at the bottom states: 'Register for 2 more of these "partner courses" and save 25%'.



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PREVENTION OF SIGNIFICANT DETERIORATION CONSTRUCTION PERMIT APPLICATION

New South Lumber Company / Bucks, Alabama



Prepared By:

Rachael Broadway – Senior Consultant
Jeremiah Redman – Managing Consultant

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September 2025
Revised March 2026

Project 230101.0043

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	1-1
1.1 Permitting and Regulatory Requirements	1-2
1.2 BACT Determination	1-3
1.3 Application Contents	1-3
2. PROPOSED PROJECT DESCRIPTION	2-1
2.1 Proposed Facility Description	2-1
2.1.1 Log Preparation	2-1
2.1.2 Sawmill	2-1
2.1.3 Lumber Drying Kilns	2-1
2.1.4 Planer Mill	2-2
2.1.5 Emergency Fire Pump Engine and Generators	2-2
2.1.6 Miscellaneous Sources	2-2
3. EMISSION CALCULATION METHODOLOGY	3-1
3.1 Direct-Fired Continuous Kilns	3-1
3.2 Log Preparation and Sawmill	3-1
3.3 Planer Mill	3-2
3.4 Roads	3-2
3.5 Emergency Engines	3-2
3.6 Diesel and Gasoline Tanks	3-3
3.7 Emission Summary	3-3
4. REGULATORY REVIEW APPLICABILITY	4-1
4.1 New Source Review Applicability	4-1
4.2 Title V Operating Permits	4-4
4.3 New Source Performance Standards	4-4
4.3.1 40 CFR 60 Subpart A – General Provisions	4-5
4.3.2 40 CFR 60 Subpart Dc – Small Industrial-Commercial Steam Generating Units	4-5
4.3.3 40 CFR 60 Subpart Kb – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, and On or Before October 4, 2023	4-5
4.3.4 40 CFR 60 Subpart Kc – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commences After October 4, 2023	4-5
4.3.5 NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	4-7
4.3.6 NSPS Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	4-7
4.3.7 Non-Applicability of All Other NSPS	4-8
4.4 National Emission Standards for Hazardous Air Pollutants	4-8
4.4.1 40 CFR 63 Subpart A – General Provisions	4-9
4.4.2 40 CFR 63 Subpart DDDD – Plywood and Composite Wood Products	4-9
4.4.3 40 CFR 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters	4-9
4.4.4 40 CFR 63 Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers at Area Sources	4-10

4.4.5	NESHAP Subpart ZZZZ– Stationary Reciprocating Internal Combustion Engines.....	4-10
4.4.6	40 CFR 63 Subpart CCCCCC – Gasoline Dispensing Facilities.....	4-11
4.4.7	Non-Applicability of All Other NESHAP	4-11
4.5	Compliance Assurance Monitoring	4-11
4.6	State Regulatory Requirements	4-11
4.6.1	ADEM Admin. Code R. 335-3-4-.01 – Visible Emissions	4-11
4.6.2	ADEM Admin. Code R. 335-3-4-.02 – Fugitive Dust and Fugitive Emissions	4-12
4.6.3	ADEM Admin. Code R. 335-3-4-.03 – PM from Fuel Burning Equipment	4-12
4.6.4	ADEM Admin. Code R. 335-3-4-.04 – PM from Process Industries	4-12
4.6.5	ADEM Admin. Code R. 335-3-5-.01 – SO ₂ from Fuel Combustion.....	4-12
4.6.6	ADEM Admin. Code R 335-3-6-.01 through .53 – VOC Emissions.....	4-12
4.6.7	ADEM Admin. Code R 335-3-6-.04 – Fixed-Roof Petroleum Liquid Storage Vessels.....	4-13
4.6.8	ADEM Admin. Code R 335-3-6-.07 – Gasoline Dispensing Facilities – Stage I.....	4-13
4.6.9	ADEM Admin. Code R. 335-3-10 – Standards of Performance for New Stationary Sources	4-13
4.6.10	ADEM Admin. Code R. 335-3-11 – National Emission Standards for Hazardous Air Pollutants	4-13
4.6.11	ADEM Admin. Code R. 335-3-14-.04 – PSD Permitting	4-13
4.6.12	ADEM Admin. Code R. 335-3-16. – Major Source Operating Permit	4-13
4.6.13	Non-Applicability of Other ADEM Air Regulations	4-13
5.	BACT ANALYSIS METHODOLOGY	5-1
5.1	BACT REQUIREMENTS.....	5-1
5.2	BACT DEFINITION.....	5-2
5.2.1	Emission Limitation	5-2
5.2.2	Each Air Pollutant.....	5-3
5.2.3	Achievable.....	5-3
5.2.4	Floor.....	5-4
5.3	BACT “TOP-DOWN” APPROACH.....	5-4
5.3.1	Identification of Potential Control Technologies (Step 1)	5-4
5.3.2	Elimination of Technically Infeasible Control Options (Step 2).....	5-5
5.3.3	Rank of Remaining Control Technologies (Step 3)	5-6
5.3.4	Evaluation of Most Stringent Control Technologies (Step 4).....	5-6
5.3.5	Selection of BACT (Step 5).....	5-7
5.4	DEFINING THE SOURCE	5-7
6.	LUMBER DRYING KILNS VOC ASSESSMENT	6-1
6.1	Identification of Potential Control Technologies – Lumber Drying Kilns (Step 1).....	6-1
6.2	Technically Infeasible VOC Controls – Lumber Drying Kilns (Step 2)	6-1
6.2.1	Adsorption.....	6-1
6.2.2	Biofiltration.....	6-1
6.2.3	Condensation	6-2
6.2.4	Thermal Oxidation.....	6-2
6.2.5	Wet Scrubbing	6-2
6.2.6	Proper Maintenance and Operating Practices	6-2
6.3	Summary and Ranking of Remaining VOC Controls – Lumber Drying Kilns (Step 3) .	6-2
6.4	Evaluation of Most Stringent VOC Controls – Lumber Drying Kilns (Step 4).....	6-3
6.4.1	Regenerative Thermal Oxidation.....	6-3
6.4.2	Proper Maintenance and Operating Practices	6-3
6.5	Selection of VOC BACT – Lumber Drying Kilns (Step 5).....	6-3

6.6	VOC BACT – Biomass-Fired Burner Abort Stacks	6-4
7.	EMERGENCY ENGINES VOC ASSESSMENT	7-1
7.1	Identification of All Available Control Technologies	7-1
7.2	Technically Infeasible VOC Controls – Emergency Engines	7-1
7.3	Summary and Ranking of Remaining VOC Controls – Emergency Engines	7-1
7.4	Evaluation of Most Stringent VOC Controls – Emergency Engines.....	7-1
7.5	Selection of VOC BACT – Emergency Engines.....	7-1
8.	GHG BACT EVALUATION	8-1
8.1	BACT Step 1 – Identify All Control Technologies	8-1
8.1.1	Available GHG Control Technologies for External Combustion Units	8-4
8.1.2	Available GHG Control Technologies for Internal Combustion Emergency Engines.....	8-5
8.2	BACT Step 2 – Eliminate Technically Infeasible Control Options	8-6
8.2.1	Technically Feasible GHG Control Technologies	8-6
8.3	BACT Step 3 – Rank Remaining Control Options by Effectiveness.....	8-7
8.3.1	Effectiveness Ranking of GHG Control Technologies	8-7
8.4	BACT Step 4 – Evaluate Most Effective Controls and Document Results	8-7
8.4.1	Economic, Environmental, and Energy Impacts of GHG Control Technologies.....	8-7
8.5	BACT Step 5 – Select BACT Limitations	8-7
8.5.1	BACT Selection of GHG Control Technologies	8-7
9.	ADDITIONAL IMPACTS ANALYSIS	9-1
9.1	Growth Analysis	9-1
9.2	Soils and Vegetation Analysis	9-1
9.3	Visibility Analysis	9-1
9.4	Class I Requirements	9-1
	APPENDIX A. SITE MAP AND PROCESS DIAGRAMS	A-1
	APPENDIX B. DETAILED EMISSIONS CALCULATIONS	B-1
	APPENDIX C. RBLC DATABASE TABLES	C-1
	APPENDIX D. DETAILED BACT COST CONTROL CALCULATIONS	D-1
	APPENDIX E. ADEM APPLICATION FORMS	E-1
	APPENDIX F. OZONE MERPS ASSESSMENT	F-1
	APPENDIX G. PROPOSED PERMIT CONDITIONS AND MONITORING	G-1
	APPENDIX H. CITED MATERIALS	H-1
	APPENDIX I. OPERATION AND MAINTENANCE PLANS FOR KILNS	I-1

LIST OF TABLES

Table 1-1. Proposed Facility NSR Source Status & Project Status	1-2
Table 1-2. Summary of Proposed BACT Limits	1-3
Table 3-1. Facility Title V & NSR Source Status	3-3
Table 4-1. Proposed Project NSR Source Status & Project Status	4-2
Table 4-2. PM Emission Factors for Compliance Tracking	4-3
Table 4-3. Emissions Standards for Emergency Engines	4-8
Table 5-1. Summary of Proposed BACT Limits	5-1
Table 6-1. Remaining VOC Control Technologies	6-3
Table 8-1. GHG Emissions from Combustion Sources	8-5
Table 8-2. Emission Factors for Various Fuels	8-6
Table 8-3. Remaining Control Technologies Ranked by Effectiveness for GHG	8-7

1. EXECUTIVE SUMMARY

New South Lumber Company (New South or NSLC) proposes changes to the recently constructed lumber mill in Bucks, Mobile County, Alabama (Bucks Sawmill). The Bucks Sawmill is located at 14083 U.S. Highway 43 in Bucks, Alabama. The facility consists of two (2) new direct-fired biomass continuous lumber kilns, one (1) natural gas continuous lumber kiln, a sawmill, a planer mill, and associated material handling equipment. New South is applying for an expansion to the Bucks Sawmill to increase site-wide lumber production.

Air Permit Nos. 503-S002-X001 through X005 were issued on May 30, 2024, for the initial construction of the facility as a Greenfield site. New South constructed and began operations in October 2024. On March 3, 2025, Air Permit Nos. 503-S002-X006 and X007 were issued, replacing Air Permit No. X005, for as-built changes to the emergency fire pump and emergency generators. Based on operations since October 2024, New South has determined that the initial construction permitting is not sufficient to cover the operations of the Bucks Sawmill. New South proposes to install an additional natural gas continuous lumber kiln, an increased facility-wide lumber production, and changes to control devices on the existing planer mill as part of the permit application.

The initial facility construction and the proposed facility modifications are within the 5-year contemporaneous period from the commencement of construction to the time of normal operation for the modified processes. The initial construction and proposed modifications will utilize many of the same processes throughout the lumber mill. The two projects are interdependent. Therefore, New South is evaluating the initial construction and proposed modifications as a single construction project.

An updated application was submitted to the Alabama Department of Environmental Management (ADEM) on January 30, 2026, which detailed the proposed changes and included requested Synthetic Minor Source (SMS) limits for the avoidance of federal Prevention of Significant Deterioration (PSD) air permitting for particulate matter (PM) species. However, upon review with ADEM on the proposed structure of the draft air permit(s) and the associated compliance requirements, NSLC is requesting a revised strategy to demonstrate compliance with the limitations imposed by avoidance of the federal PSD air permitting program. A PSD avoidance strategy does not inherently impose any short-term (i.e., lb/hr) emissions limitations, but rather requires that the site-wide emissions remain below the PSD Significant Emissions Rates (SERs) for major sources. Therefore, NSLC submits this revised application with a proposed approach to utilize the required testing, along with production and operational records tracking, to demonstrate compliance with the imposed facility-wide limitations for the avoidance of PSD permitting for PM species. This proposed tracking is outlined in detail in Section 4.1 and also in Table B-34 of Appendix B

Under existing Air Permit No. X002, daily visible emission observations (VEO) must be conducted if a kiln is operating. However, NSLC requests the removal of these VEOs in future permits. NSLC feels the justification for the removal of visible emissions monitoring on the continuous kilns is warranted due to several practical limitations inherent in the kiln design and operation. The high moisture content present in the exhaust stacks significantly interferes with the accuracy and reliability of VEOs. In addition, the exhaust streams from the continuous kilns are not easily controlled or isolated, making reliable monitoring technically challenging. Furthermore, the operational nature of the kilns—characterized by fluctuating process conditions and variable loading—further complicates the ability to obtain consistent and meaningful emissions data. For these reasons, removal of the visible emissions monitoring requirement is considered necessary and appropriate under the current circumstances.

This application package contains the necessary state and federal air construction and operating permit application for the existing facility and proposed changes, which includes potential emissions calculations, state and federal air regulatory review, state implementation plan (SIP) forms, and federal permitting requirements (e.g., BACT, Class I Area analysis, and additional impacts analyses). Note that no air dispersion modeling is included in this application as federal permitting is triggered for volatile organic compounds (VOC) and greenhouse gases (GHG).

1.1 Permitting and Regulatory Requirements

The facility is located in Bucks, Mobile County, Alabama, which is currently designated as “attainment” or “unclassifiable” for all criteria pollutant’s National Ambient Air Quality Standard (NAAQS). Therefore, the facility is not subject to Nonattainment New Source Review (NNSR) and is subject to Prevention of Significant Deterioration (PSD) permitting, which is discussed in Section 4.1 of this application.

Lumber mills are not on the list of 28 named source categories. Therefore, the PSD major source threshold is 250 tons per year (tpy) of a criteria air pollutant. The Bucks Sawmill is a major source with respect to the PSD program as the potential emissions of volatile organic compounds (VOC) for the facility exceeds the PSD major source threshold as detailed in Table 1-1. Accordingly, the proposed project emission increases are then compared to the PSD Significant Emission Rates (SERs) to determine if the proposed project triggers PSD permitting. The proposed project will result in emissions exceeding the PSD SERs for VOC, and greenhouse gas (GHG) as detailed in Table 1-1. Therefore, PSD review is required for each of those pollutants. Additional information on the net emission increase calculations can be found in Section 3.

Air dispersion modeling is required for all pollutants that have a NAAQS for which the net emissions increase from the project exceeds the SER. As VOC and GHG do not have a NAAQS, no modeling was completed for this application.

Table 1-1. Proposed Facility NSR Source Status & Project Status

Pollutant	Potential Facility-Wide Emissions ¹ (tpy)	PSD Major Source		PSD SER (tpy)	PSD Permitting Required? (Yes/No)
		Threshold (tpy)	PSD Major? (Yes/No)		
Filterable PM	15.63	250	No	25	No
Total PM ₁₀	11.44	250	No	15	No
Total PM _{2.5}	9.96	250	No	10	No
NO _x	36.28	250	No	40	No
CO	65.89	250	No	100	No
VOC	734.46	250	Yes	40	Yes
SO ₂	7.23	250	No	40	No
CO ₂ e	119,839	100,000	Yes	75,000	Yes
Total HAP	47.5	N/A	No	N/A	No
Max Individual HAP ²	26.2	N/A	No	N/A	No

1. Potential Facility-Wide Emissions represent only point source emissions.

2. The maximum individual HAP is methanol.

1.2 BACT Determination

New South performed a Best Available Control Technology (BACT) analysis for each of the PSD-regulated pollutants that exceeded their SERs (VOC and GHG), following the “top-down” approach suggested by the United States Environmental Protection Agency (U.S. EPA). The top-down process begins by identifying all potential control technologies for the pollutant in question and determining if those control options are feasible for the process in question. The approach then involves ranking all potentially relevant control technologies in descending order of control effectiveness. The most stringent or “top” control option is BACT unless the applicant demonstrates, and the permitting authority in its informed opinion agrees, that energy, environmental, and/or economic impacts justify the conclusion that the most stringent control option does not meet the definition of BACT. In the event the top option is not determined to be BACT, the next most stringent alternative is evaluated in the same manner. This process continues until BACT is selected.

Based on the BACT review, New South proposes the technology and limits presented in Table 1-2 as BACT for the proposed emission units. The detailed BACT analysis is presented in Sections 5, 6, 7, and 8 of this application.

Table 1-2. Summary of Proposed BACT Limits

Unit	Pollutant	Selected BACT	Emissions/ Operating Limit	Compliance Method
Continuous Kilns	VOC	Proper Maintenance and Operating Practices	4.75 lb/MBF (All kilns)	Recordkeeping
	GHG	Optimum Combustion Fuel Selection Good Design and Operating Practices	Rolling 12-month basis 36,827 tpy (Biomass) 23,080 tpy (Natural gas)	Recordkeeping
Emergency Fire Pump	VOC	Good Combustion Practices Limiting Operating Hours Optimum Combustion	2.47E-03 lb/HP-hr	Recordkeeping
	GHG	Fuel Selection Good Design and Operating Practices	1.15 lb/HP-hr	Recordkeeping
Emergency Generator Engines	VOC	Good Combustion Practices Limiting Operating Hours Optimum Combustion	0.12 lb/HP-hr	Recordkeeping
	GHG	Fuel Selection Good Design and Operating Practices	110.1 lb/MMBtu	Recordkeeping

1.3 Application Contents

This permit application is organized as follows:

- ▶ Section 2 contains description of the facility and proposed project;
- ▶ Section 3 summarizes emissions calculation methodologies and assesses PSD applicability;
- ▶ Section 4 details the federal & state regulatory applicability analysis for the facility and proposed project;
- ▶ Section 5 contains the BACT analysis methodology;
- ▶ Section 6 contains the VOC BACT assessment for lumber kilns;
- ▶ Section 7 contains the VOC BACT assessment for the emergency fire pump engine and generators;
- ▶ Section 8 contains the GHG BACT assessment for all combustion sources;
- ▶ Section 9 contains the additional impact analysis;

- ▶ Appendix A includes an area map, site plot plan, simplified process flow diagram, and detailed engineering drawings;
- ▶ Appendix B includes detailed potential emission calculations;
- ▶ Appendix C includes the applicable Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database tables;
- ▶ Appendix D includes the detailed BACT control cost calculations;
- ▶ Appendix E contains the ADEM construction permit application forms;
- ▶ Appendix F contains the required ozone analysis for triggering PSD for VOC;
- ▶ Appendix G includes proposed permit monitoring conditions;
- ▶ Appendix H includes cited and reference materials; and
- ▶ Appendix I contains operation and maintenance plans for the continuous kilns.

2. PROPOSED PROJECT DESCRIPTION

The Bucks Sawmill produces planed lumber from incoming logs. The raw material for planed lumber, the principal product, is southern yellow pine logs. Emission-generating operations at the mill include log preparation, the sawmill, the lumber drying kilns, the planer mill (lumber finishing), and the shipping area. Lumber mills are classified under Standard Industrial Classification (SIC) code 2421. A process flow diagram for the Bucks Sawmill is provided in Appendix A.

2.1 Proposed Facility Description

2.1.1 Log Preparation

The basic function of the initial log processing area is to prepare logs for further processing within the lumber area. Tree length logs are delivered by truck to the mill on paved roads and off-loaded by cranes. Delivered logs are sorted, stacked, and inventoried for processing or placed on wet deck storage. Once entering the log preparation process, logs are cut to the desired length by saws, and mechanically fed into the debarker. The logs are then scanned for metal to prevent damage to processing equipment and to reduce the possibility of personnel injury.

Wood residuals, to include bark and wood chips, are mechanically conveyed to truck loadout storage bins before being sold off-site as a byproduct. Poor quality log parts are chipped and sold as a paper mill fiber source or distributed for other purposes.

2.1.2 Sawmill

Logs entering the sawmill building are converted into various-sized green timbers or dimension lumber using a series of sawing techniques. Dimension lumber and timbers are sawed, trimmed at the green trimmer, sorted by length and dimension, stacked on sticks, and sold as rough green lumber or sent to the lumber kilns for drying. Large defect pieces from the sawmill are chipped and sold as a byproduct or distributed for other purposes.

Green sawdust from this process is collected and pneumatically conveyed to one of two fuel storage silos for the biomass fired kilns. Emissions are controlled by individual cyclones on each fuel silo.

2.1.3 Lumber Drying Kilns

Packs of lumber from the sawmill area are stacked onto carts, which are then pushed on rail tracks into one of three lumber drying kilns. In the lumber drying area, packs of green lumber are heated to dry the lumber to a moisture content between 15-20%. The facility operates two, direct-fired biomass continuous kilns (CDK1, CDK2) and one direct-fired natural gas continuous kiln (CDK3), and plans to construct one additional direct-fired natural gas continuous kiln (CDK4). Each biomass kiln has a 40 Million British Thermal Unit per hour (MMBtu/hr) sawdust burner and a maximum capacity of 92.5 million board feet (MMBF) annually. Each natural gas kiln is, or will be, equipped with a 45 MMBtu/hr natural gas burner and have a maximum capacity of 100 MMBF annually. Emissions from the kilns are directed through powered stacks at the end of each kiln or allowed to vent naturally through the kiln doors.

Normal operations of kilns require periodic startup and shutdown for maintenance checks. During periods of startup for the biomass kilns, the abort stack will vent directly into the atmosphere. Diesel fuel and biomass will be used to ignite the burner of each biomass burner. The natural gas kilns will not need to be vented to

atmosphere during startup or shutdown. Abort stack usage for all kilns will be monitored and recorded by New South.

2.1.4 Planer Mill

Dried, rough lumber is sent from the lumber kilns to be finished in the planer mill. Each board passes through a planer to dress the surfaces and finish the board to its final thickness and width. Dry shavings from the planer mill are collected and pneumatically conveyed via a quad pack cyclone and high efficiency cyclone to a truck bin and stored until sold and loaded into trucks. After planing, each board is grade-stamped and packaged for shipping. The finished product is then stored in inventory or loaded and shipped off-site.

New South is proposing to replace the existing pneumatic system. The new pneumatic system will have a higher air flow capacity to accommodate the anticipated increase to kiln production. Air will be circulated through the cyclone-baghouse system by a 99,090 ACFM shared fan. Dry shavings collected from the enclosed planer mill will be processed through a closed loop cyclone to separate out the large shavings. Large shavings from the cyclone will then be directed pneumatically via the shared fan to the existing dry shavings truck bin. The exhaust from the cyclone will be directed through a baghouse. The baghouse will collect dry shavings and particulate matter not previously separated by the cyclone. The remaining collected material from the baghouse will be directed pneumatically via the shared fan to the existing dry shavings truck bin. The baghouse will exhaust the cleaned air to atmosphere. Return air from the truck loadout will re-enter the cyclone-baghouse system to remove any residual particles. The truck bin will not have a separate control device.

2.1.5 Emergency Fire Pump Engine and Generators

New South installed a 305-hp diesel-fired emergency fire pump engine (ENG1), two (2) 54-hp natural gas-fired emergency generators (GEN1, GEN2), and one (1) 69-hp natural gas-fired emergency generator (GEN3) at the Bucks Sawmill. New South has an hourly limit of 100 hours of non-emergency operation on each engine/generator to comply with the emergency engine requirements under 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII and JJJJ.

2.1.6 Miscellaneous Sources

Logs, chips, sawdust, bark, and shavings are shipped into or out of the mill by trucks. Finished lumber is shipped off-site via truck. Utility vehicles such as forklifts and loaders are used to transport/load/unload materials throughout the mill. The Bucks Sawmill houses diesel and gasoline dispensing stations for their mobile equipment. Diesel and gasoline are stored in fuel storage tanks prior to use. Fugitive emissions of particulate matter result from travel on paved roads.

3. EMISSION CALCULATION METHODOLOGY

This section addresses the methodology used to quantify the emissions from the facility and assesses federal New Source Review (NSR) permitting applicability. Emissions from the facility include carbon monoxide (CO), volatile organic compounds (VOC), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), filterable particulate matter (PM, PM₁₀, PM_{2.5}), greenhouse gases (GHG) in the form of carbon dioxide equivalents (CO_{2e}), and hazardous air pollutants (HAP). These emissions occur as a result of combustion in the kiln burners, drying of lumber, and other process operations at the facility. Detailed emission calculations are presented in Appendix B. Emission factor source materials are presented in Appendix H.

3.1 Direct-Fired Continuous Kilns

Potential emissions from the direct-fired continuous kilns were evaluated using the regulatory emission standards, maximum production capacities of each kiln (MBF/yr) and the burner heat input capacities (MMBtu/yr) in conjunction with U.S. EPA AP-42 emission factors, along with other publicly available sources (e.g. air permit applications submitted by wood lumber facilities to state environmental agencies). The emission factors for VOC and HAP from kiln drying were based on State of Georgia (EPD) Recommended Emission Factors for Lumber Kiln Permitting. The emission factors for CO_{2e} emissions from natural gas combustion were based on factors established in the Greenhouse Gas Mandatory Reporting (MRR) rule in 40 CFR 98, Table C-1 and C-2. Appendix B and H provide a detailed list of emission factors and their sources.

Potential emissions from the direct-fired continuous kilns were calculated by multiplying the maximum production capacity of dried lumber from the kiln (MBF/year) by the appropriate emission factor (lb/MBF). Potential emissions from the wood-fired and natural-gas burners were calculated based on the fuel firing capacity (MMBtu/yr) multiplied by the pollutant emission factor (lb/MMBtu). The total emissions from the kilns were separated into point source emissions at 80% and fugitive emissions at 20%.¹

Emissions from the startup process of the biomass kilns have been estimated at four (4) events annually. Combustion emissions from diesel fuel were evaluated using AP-42, Section 1.3, Fuel Oil Combustion. Combustion emissions from biomass were evaluated using the emission factors from normal operation at the reduced firing rate of 25% of maximum total emissions, except VOC emissions. VOC emissions from the abort stack startup process for biomass combustion are based on AP-42, Section 1.6, Wood Residue Combustion in Boilers at the full firing capacity of the associated burner.

3.2 Log Preparation and Sawmill

Fugitive PM emissions from sawing, debarking, and chipping were based on the lumber throughput associated with the aforementioned portions of the facility. A control efficiency of 90% was applied to account for the sawmill activities being performed indoors. A control efficiency of 70% was applied to account for the debarking and chipping activities being performed partially enclosed. Note that this control efficiency does not take into account that the wood being cut and handled has a high moisture content and would therefore generate less PM emissions than dry materials.

¹ Point source and fugitive source emissions were utilized to align with continuous kiln modeling guidance from ADEM.

The filterable PM, PM₁₀, and PM_{2.5} emission factors for log debarking, bark hogging, log chipping and the mechanical conveyance of materials were based on the EPA Region 10 Particulate Matter Potential to Emit Emissions for Activities at Sawmill, excluding Boilers² and AP-42, Section 13.2.³

Emissions of PM from the fuel silo cyclones occur from the pneumatic conveyance of green sawdust to the silos. The state regulatory allowable is conservatively estimated by combining the total throughput emissions for bark hogging and log chipping operations, then dividing that sum by the two fuel silos. Actual emissions for the fuel silo cyclones are estimated based on the process rate of the sawdust burners. There are no plans for additional storage of sawdust onsite. These emissions are estimated using emission factors from EPA Region 10 Particulate Matter Potential to Emit Emissions for Activities at Sawmill, excluding Boilers⁴ and AP-42, Section 13.2 and utilized aerodynamic particle-size distribution conducted from engineering tests conducted at the Bucks Sawmill in January 2025 for sawdust/shavings conveyance through cyclones.⁵ The aerodynamic particle-size distribution from dry wood waste handling system is utilized to be conservative. The fuel silo cyclones only handle green material and should therefore be less emissive of small diameter particulate matter. Additionally, the throughput of each fuel silo cyclone is limited by the operation of the sawdust burners of each biomass kiln as no additional storage of sawdust used for burner fuel is available onsite. Canfor is proposing to limit the operating hours of the sawmill to 6,000 hours per rolling 12-month period.

3.3 Planer Mill

The planer mill emissions are currently controlled by a series of cyclones (quad pack cyclones to high-efficiency cyclone) and then gravity fed into a storage bin. Due to the proposed increase in lumber production, New South is removing the existing system. PM Emissions from the proposed cyclone and baghouse system from the planer mill were calculated using the exhaust flow rate and PM outlet grain loading rate provided by the cyclone vendor with a capture efficiency provided by the baghouse vendor. New South conservatively estimated that PM₁₀ and PM_{2.5} will be emitted at the same rate as filterable PM. Canfor is proposing to limit the planer mill throughput to 385 MMBF per rolling 12-month period.

3.4 Roads

Fugitive PM emissions from truck traffic on the facility roadways were estimated based on the vehicle miles travelled (VMT) by trucks that will transport materials to and from the facility. Vehicle miles traveled on site were estimated based on the distance of the anticipated truck route for each material and the number of trips necessary to support operation of the facility. Emission calculations for fugitive paved road dust emissions were developed based on AP-42, Section 13.2.1, *Paved Roads*.⁶ Please note that all haul roads at the Bucks Sawmill will be paved and the speed limit will be minimized to ensure that road dust is not resuspended, and fugitive PM emissions will be kept to a minimum. Therefore, New South has applied an 85% control efficiency to the AP-42 equations due to the good work practices that New South will employ.

3.5 Emergency Engines

The fire pump engine (ENG1) is a diesel-fired engine. The emergency generator engines (GEN1, GEN2, GEN3) are natural gas-fired units. In accordance with NSPS regulations, it is assumed that each engine would operate

² EPA Region 10 Particulate Matter Potential to Emit Emissions for Activities at Sawmills, excluding Boilers, located in Pacific Northwest Indian County, May 2014.

³ Emission Factor referenced in Major Source Operating Permit renewal application for Scotch Gulf Lumber, LLC in Fulton, AL.

⁵ Aerodynamic Particle-Size Distribution conducted by New South Lumber Company – Bucks in January 2025.

⁶ U.S. EPA AP-42, Section 13.2.1, *Paved Roads*, January 2011.

no more than 100 hours per year as emergency engines.⁷ NO_x, CO, and VOC emissions from diesel and natural gas combustion in the engines were calculated using the applicable emission standards of NSPS Subpart IIII or JJJJ, based on fuel type for each engine. The emission factors for CO_{2e} emissions from diesel or natural gas combustion were based on factors established in the Greenhouse Gas Mandatory Reporting (MRR) rule in 40 CFR 98, Table C-1 and C-2. For all other pollutants, emission factors from US EPA's AP-42, Fifth Edition, Volume I, Chapter 3, Section 3.2, *Natural Gas-fired Reciprocating Engines* and Section 3.3, *Gasoline and Diesel Industrial Engines* were used to calculate emissions.

3.6 Diesel and Gasoline Tanks

The diesel and gasoline tank emissions of VOC were calculated based on tank capacities and dimensions of the tanks. These capacities and dimensions were utilized along with meteorological data from AP-42 Section 7.1, *Organic Liquid Storage Tanks* (June 2020) for Mobile, AL and AP-42 Section 5.2 for the Transportation and Marketing of Petroleum Liquids. These tanks were installed new, white or light in color, and are equipped with a submerged fill pipe. The calculations assume operating hours at 8,760 hours per year.

3.7 Emission Summary

Table 3-1 shows the total potential emissions from the facility compared to the Title V and PSD major source threshold. Detailed emission calculations can be found in Appendix B of this application report.

Table 3-1. Facility Title V & NSR Source Status

Pollutant	Potential Facility-Wide Emissions ¹ (tpy)	Title V Major Source		PSD Major Source		PSD	
		Threshold (tpy)	Title V Major? (Yes/No)	Threshold (tpy)	PSD Major? (Yes/No)	PSD SER (tpy)	Permitting Required? (Yes/No)
Filterable PM	15.63	100	No	250	No	25	No
Total PM ₁₀	11.44	100	No	250	No	15	No
Total PM _{2.5}	9.96	100	No	250	No	10	No
NO _x	36.28	100	No	250	No	40	No
CO	65.89	100	No	250	No	100	No
VOC	734.46	100	Yes	250	Yes	40	Yes
SO ₂	7.23	100	No	250	No	40	No
CO _{2e}	119,839	100,000	Yes	100,000	Yes	75,000	Yes
Total HAP	47.5	25	Yes	N/A	No	N/A	No
Max Individual HAP ²	26.2	10	Yes	N/A	No	N/A	No

1. Potential Facility-Wide Emissions represent only point source emissions.

2. The maximum individual HAP is methanol.

⁷ 40 CFR Part 60 Subpart IIII and JJJJ, specifically §60.4211(f)(2) and §60.4243(d)(2), respectively.

4. REGULATORY REVIEW APPLICABILITY

The Bucks Sawmill is subject to certain federal and state air regulations. This section of the application summarizes the air permitting requirements and key air quality regulations that apply to the Bucks Sawmill under both federal and state permitting programs. Applicability to NSR, Title V, New Source Performance Standards (NSPS), National Emissions Standards for Hazardous Air Pollutants (NESHAP), ADEM Admin. Code r., and other potentially applicable regulations are addressed.

4.1 New Source Review Applicability

The NSR permitting program generally requires a source to obtain a permit and undertake other obligations prior to construction of any project at an industrial facility if the proposed project results in an emissions increase in excess of certain pollutant threshold levels. ADEM administers its major NSR permitting program through ADEM Admin. Code R. 335-3-14-.04 *Air Permits Authorizing Construction in Clean Air Areas [Prevention of Significant Deterioration Permitting]*, which establishes preconstruction, construction, and operation requirements for new and modified sources.

The NSR program is comprised of two elements: Nonattainment NSR and PSD. NNSR pertains to facilities in nonattainment areas, and PSD is the governing program for all other facilities. The NNSR program potentially applies to new construction or modifications that result in emission increases of a particular pollutant for which the area where the facility is located is classified as “nonattainment” for that pollutant. The PSD program applies to project increases of those pollutants for which the area the facility is located in is classified as “attainment” or “unclassifiable.” The Bucks Sawmill is located in Mobile County, which has been designated by the U.S. EPA as “attainment” or “unclassifiable” for all criteria pollutants.⁸ Therefore, the facility is not subject to NNSR permitting requirements. However, new construction or modifications that result in emissions increases are potentially subject to PSD permitting requirements.

The PSD program only regulates emissions from “major” stationary sources of regulated air pollutants. A stationary source is considered PSD major if potential emissions of any regulated pollutant exceed the major source thresholds. Lumber mills are not on the “list of 28” operations which are subject to a 100 tpy PSD major source threshold; therefore, the major source threshold for all criteria pollutants for PSD is 250 tpy and 100,000 tpy for CO₂e. The Bucks Sawmill is a major source with respect to the PSD program as the potential emissions of VOC for the facility exceed the PSD major source threshold, which is detailed in Table 4-1.

Accordingly, the proposed contemporaneous project emission increases must be compared to the PSD SERs for all PSD-regulated pollutants to determine if the project triggers PSD permitting. The emission increases from the facility for each PSD-regulated pollutant compared to the respective SERs are shown in Table 4-1.

⁸ 40 CFR 81.301

Table 4-1. Proposed Project NSR Source Status & Project Status

Pollutant	Potential Facility-Wide Emissions¹ (tpy)	PSD Major Source Threshold (tpy)	PSD Major? (Yes/No)	PSD SER (tpy)	PSD Permitting Required? (Yes/No)
Filterable PM	15.63	250	No	25	No
Total PM ₁₀	11.44	250	No	15	No
Total PM _{2.5}	9.96	250	No	10	No
NO _x	36.28	250	No	40	No
CO	65.89	250	No	100	No
VOC	734.46	250	Yes	40	Yes
SO ₂	7.23	250	No	40	No
CO ₂ e	119,839	100,000	Yes	75,000	Yes
Total HAP	47.5	N/A	No	N/A	No
Max Individual HAP ²	26.2	N/A	No	N/A	No

1. Potential Facility-Wide Emissions represent only point source emissions.

2. The maximum individual HAP is methanol.

As shown in the table above, the project emissions exceed the SERs for VOC and GHG only. Therefore, PSD permitting requirements are triggered for these pollutants. All other pollutants will not trigger federal PSD permitting requirements.

Filterable PM, Total PM₁₀, and Total PM_{2.5} are limited to less than the respective SER thresholds by requested facility-wide SMS limits. NSLC will provide compliance tracking of the actual PM emissions for all emission units at the facility to demonstrate compliance with the synthetic minor limitations. Tracking of PM emissions will be maintained on a monthly basis and the 12-month rolling totals compared against the SER threshold for Filterable PM, Total PM₁₀, and Total PM_{2.5}. The specific facility-wide SMS limits for each pollutant are as follows:

- ▶ Filterable PM = 24.9 tpy
- ▶ Total PM₁₀ = 14.9 tpy
- ▶ Total PM_{2.5} = 9.96 tpy

Emission factors for the PM have been determined for each emission source. The continuous kilns have emission factors based on the board footage of lumber dried and reduced by 20% to account for fugitive emissions from normal kiln operation. These factors are expressed in lb/MBF and will be converted to tpy for the proposed of emission tracking. To track PM emissions during startup of the biomass kilns, NSLC will track the hours of abort stack usage. Abort stack emission factors are expressed in tons per hour. The natural gas kilns do not utilize abort stacks for startup.

PM emission factors for the planer mill baghouse are determined using the potential annual emissions divided by the maximum board footage that could be processed by the planer. The emission factors are expressed as

lb/MBF. Actual emissions will be tracked by multiplying by the actual board feet process and converted to tons. As no emissions should occur when lumber is not being processed, this should represent actual emissions. NSLC will conduct initial stack testing of the planer mill exhaust to determine compliance with the proposed emission factors.

PM emission factors for the fuel silos are based on the maximum amount of biomass fuel required to operate the biomass burners and are directly linked to operation of the sawmill. NSLC will use green sawdust sourced from the onsite sawmill for fuel and limited to 6,000 operating hours per year. The emission factors are expressed in terms of lb/hr. Operating hours of the sawmill (the source for the fuel) will be utilized to calculate actual emissions converted to tons.

PM emission factors for the fire pump engine are based on the regulatory limits established in NSPS IIII discussed in Section 4.3.5. PM emission factors for the three (3) emergency engines are based on the combustion of natural gas at maximum capacity of each engine. All engine factors have been converted to lb/hr. For PM emission tracking, the non-emergency operating hours of each engine will be recorded and utilized to determine actual emissions from the engines then converted to tons. All engines are limited to 100 hours per year of non-emergency use and unlimited emergency hours in accordance with NSPS IIII and JJJJ.

Emissions factors for Filterable PM, Total PM₁₀, and Total PM_{2.5} are listed for each emission unit with the corresponding emission units are provided in Table 4-2.

Table 4-2. PM Emission Factors for Compliance Tracking

EUID No	Emission Unit Description	Filterable PM Emission		Total PM ₁₀ Emission		Total PM _{2.5} Emission	
		Factor	Units	Factor	Units	Factor	Units
CDK1	Continuous Kiln No. 1	0.0568	lb/MBF	0.0832	lb/MBF	0.0792	lb/MBF
	Abort Stack Use	0.000213	ton/hr	0.000296	ton/hr	0.000276	ton/hr
CDK2	Continuous Kiln No. 2	0.0568	lb/MBF	0.0832	lb/MBF	0.0792	lb/MBF
	Abort Stack Use	0.000213	ton/hr	0.000296	ton/hr	0.000276	ton/hr
CDK3	Continuous Kiln No. 3	0.0104	lb/MBF	0.0192	lb/MBF	0.0189	lb/MBF
CDK4	Continuous Kiln No. 4	0.0104	lb/MBF	0.0192	lb/MBF	0.0189	lb/MBF
PLN1	Planer Mill	0.0029	lb/MBF	0.0029	lb/MBF	0.0029	lb/MBF
ENG1	Emer. Fire Water Pump	1.00E-01	lb/hr	6.71E-01	lb/hr	6.71E-01	lb/hr
GEN1	Emer. Gen. Engine No. 1	2.91E-05	lb/hr	2.91E-05	lb/hr	2.91E-05	lb/hr
GEN2	Emer. Gen. Engine No. 2	2.91E-05	lb/hr	2.91E-05	lb/hr	2.91E-05	lb/hr
GEN3	Emer. Gen. Engine No. 3	3.72E-05	lb/hr	3.72E-05	lb/hr	3.72E-05	lb/hr
SC01	Fuel Silo Cyclone No. 1	1.46	lb/hr	0.20	lb/hr	0.0204	lb/hr
SC02	Fuel Silo Cyclone No. 2	1.46	lb/hr	0.20	lb/hr	0.0204	lb/hr

An example of the proposed PM emission tracking is as follows:

Total PM2.5 (tpy)

$$\begin{aligned}
 &= \frac{CDK1\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK2\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \frac{CDK3\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} + \frac{CDK4\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \left[\text{Abort Stack}\ EF\ \left(\frac{ton}{yr}\right) \times \text{Startup hours}\ \left(\frac{hr}{yr}\right) \right] + \frac{\text{Fuel Silo Cyclone 1}\ EF\ \left(\frac{lb}{hr}\right) \times hr/yr}{2,000\ lb/ton} \\
 &+ \frac{\text{Fuel Silo Cyclone 2}\ EF\ \left(\frac{lb}{hr}\right) \times hr/yr}{2,000\ lb/ton} + \frac{\text{Planer}\ EF\ \left(\frac{lb}{MBF}\right) \times MBF/yr}{2,000\ lb/ton} \\
 &+ \frac{ENG1\ EF\ \left(\frac{lb}{hr}\right) \times \text{Non - Emerg. Hours}\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} + \frac{GEN1\ EF\ \left(\frac{lb}{hr}\right) \times \text{Non - Emerg. Hours}\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} \\
 &+ \frac{GEN2\ EF\ \left(\frac{lb}{hr}\right) \times \text{Non - Emerg. Hours}\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton} + \frac{GEN3\ EF\ \left(\frac{lb}{hr}\right) \times \text{Non - Emerg. Hours}\ \left(\frac{hr}{yr}\right)}{2,000\ lb/ton}
 \end{aligned}$$

4.2 Title V Operating Permits

40 CFR 70 establishes the federal Title V operating permit program. Alabama has incorporated the provisions of this federal program in its state regulation, Rule 335-3-16, *Major Source Operating Permits*. This regulation requires that all new and existing Title V major sources of air emissions obtain federally approved state administered operating permits. A major source as defined under the Title V program is a facility that has the potential to emit either more than 100 tpy for any criteria pollutant, more than 10 tpy for any single HAP, or more than 25 tpy for all HAP.⁹ Potential emissions from the Bucks Sawmill exceed the major source threshold for several pollutants. Therefore, a Title V permit is required for the operation of the Bucks Sawmill. New South will provide an application for a Title V Operating permit within 12 months of startup for the new process equipment and modification to the existing facility, pursuant to the requirements in 40 CFR Part 70.¹⁰

4.3 New Source Performance Standards

NSPS, located in 40 CFR 60, require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. The following is a summary of applicability and non-applicability determinations for NSPS regulations of relevance to the proposed project. Rules that are specific to certain source categories are not discussed in this regulatory review.

⁹ Per 335-3-16-.01(1)(q)3, a source cannot be considered a major Title V source based solely on the emissions of greenhouse gases.

¹⁰ Initial Temporary Authorization to Operate was issued to the facility on October 16, 2024, for Air Permit No. 503-S002-X001. New South submitted an initial Title V Operating Permit application to ADEM on October 13, 2025.

4.3.1 40 CFR 60 Subpart A – General Provisions

All affected sources subject to source-specific NSPS are subject to the general provisions of NSPS Subpart A unless specifically excluded by the source-specific NSPS. Subpart A requires initial notification, performance testing, recordkeeping and monitoring, provides reference methods, and mandates general control device requirements for all other subparts as applicable. As the emergency engines installed at the Bucks Sawmill will be subject to NSPS Subpart IIII or Subpart JJJJ, Subpart A will also be applicable.

4.3.2 40 CFR 60 Subpart Dc – Small Industrial-Commercial Steam Generating Units

NSPS Subpart Dc, *Small Industrial-Commercial-Institutional Steam Generating Units*, applies to steam generating units rated between 10 and 100 MMBtu/hr constructed, modified, or reconstructed after June 9, 1989. The term “steam generating unit” is defined under this regulation as shown below:

“Steam generating unit means a device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This term includes any duct burner that combusts fuel and is part of a combined cycle system. This term does not include process heaters as defined in this subpart.”¹¹

The lumber kilns each operate with a direct-fired biomass or natural gas burner. Additionally, the burners do not generate steam because the combustion gases from the fuel directly contact the lumber during the drying process. Therefore, Subpart Dc is not applicable to the kiln burners.

4.3.3 40 CFR 60 Subpart Kb – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, and On or Before October 4, 2023

NSPS Subpart Kb applicability definition in 40 CFR 60.110b(a) provides:

“The affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m³) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984, and on or before October 4, 2023.”

New South operates diesel and gasoline storage tanks with storage capacities much smaller than 75 m³ at the Bucks Sawmill. Therefore, this rule does not apply.

4.3.4 40 CFR 60 Subpart Kc – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commences After October 4, 2023

NSPS Subpart Kc applicability definition in 40 CFR 60.110c(a) provides:

“The affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 20,000 gallons (gal) (75.7 cubic meters (m³)) that

¹¹ 40 CFR 60.41c.

is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after October 4, 2023.”

New South operates diesel and gasoline storage tanks with storage capacities much smaller than 75.7 m³ at the Bucks Sawmill. Therefore, this rule does not apply.

4.3.5 NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII regulates criteria pollutant emissions from stationary compression ignition (CI) internal combustion engines (ICE) constructed after July 11, 2005, where construction is the date the engine is ordered by the owner or operator, and manufactured after April 1, 2006 and are not fire pump engines. The emergency fire pump engine meets the definition of emergency stationary ICE in 40 CFR 60.4219.

Emergency fire pump engine has a maximum engine power greater than 130 KW and less than 560 KW and a displacement of less than 10 liters per cylinder. Per 40 CFR 60.4202(d), the fire pump engine must meet the applicable emission standards of Table 4 NSPS Subpart IIII. As the engine is manufactured after 2009, it will be subject to the emission limits detailed in Table 4 to Subpart IIII of Part 60 – Emission Standards for Stationary Fire Pump Engines. This engine will be subject to fuel specifications as provided in 40 CFR 60.4207.

New South purchased an engine that complies with the respective emission limits. In addition, New South operates and maintains the engine according to the manufacturer's required schedules, including parts replacements. The engine is equipped with a non-resettable hour meter per the requirements of 40 CFR 4209(a).

Per 40 CFR 60.4211(f), emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hr/yr. There is no time limit on the use of emergency stationary ICE in emergency situations given in the regulation.

No initial notifications are required for emergency engines, per 40 CFR 60.4214(b). New South must keep records of the operation of the engine in emergency and non-emergency services that are recorded through the non-resettable hour meter. New South must record the time of operation of the engine and the reason the engine was in operation during that time.

4.3.6 NSPS Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ, *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines*, is potentially applicable to stationary ICE based on the date each engine was constructed, reconstructed, or modified. The rule sets emissions standards for NO_x, CO, and VOC emissions for engines classified by size and date of manufacture or reconstruction.

Pursuant to 40 CFR 60.4230(a)(4)(iv), owners and operators of stationary SI ICE that commence construction on or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 KW (25 HP) are subject to NSPS Subpart JJJJ. New South operates three natural gas-fired emergency generators (GEN1, GEN2, GEN3). All engines will be manufactured after January 1, 2009; therefore, they will be subject to the requirements under this part.

NSPS Subpart JJJJ establishes emission limitations for different types of engines. The three emergency generator engines, rated at 35 kW, 35 kW, and 45 kW, meet the definition of an emergency stationary internal combustion engine (ICE) in 40 CFR 60.4248. Pursuant to 40 CFR 60.4233(e), the emergency engines

must meet the emission standards of Table 1 to NSPS Subpart JJJJ for all pollutants. Table 4-2 summarizes the applicable emissions standards:

Table 4-3. Emissions Standards for Emergency Engines

Pollutant	Emission Standards (g/hp-hr)
NO _x ^a	10
CO	387
VOC	N/A

- a. The emission standards applicable to emergency engines between 25 hp and 130 hp are in terms of NO_x + HC.

Pursuant to 40 CFR 60.4243(b), New South purchased engines certified by the manufacturer to the procedures of this subpart and complying using the methods specified in 40 CFR 60.4243(d) for emergency stationary ICE.

Pursuant to 40 CFR 60.4237(a), each emergency engine is required to be equipped with a non-resettable hour meter. Per 40 CFR 60.4243(d), emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hr/yr. There is no time limit on the use of emergency stationary ICE in emergency situations given in the regulation. Pursuant to 40 CFR 60.4245(b), the Bucks sawmill must keep records of the hours of operation recorded through the non-resettable hour meter, hours spent for emergency operation (including what classified the operation as emergency), and the hours spent for non-emergency operation.

4.3.7 Non-Applicability of All Other NSPS

NSPS are developed for particular industrial source categories. The applicability of a particular NSPS to the proposed project can be readily ascertained based on the industrial source category covered. All other NSPS, besides Subpart A, are categorically not applicable to the Bucks Sawmill.

4.4 National Emission Standards for Hazardous Air Pollutants

NESHAP, located in 40 CFR 61 and 40 CFR 63, have been promulgated for source categories that emit HAP to the atmosphere. A facility that is a major source of HAP is defined as having potential emissions of greater than 25 tpy of total HAP and/or 10 tpy of individual HAP. Facilities with a potential to emit HAP at an amount less than that which is defined as a major source are otherwise considered an area source. The NESHAP allowable emissions limits are most often established on the basis of a maximum achievable control technology (MACT) determination for the particular major source. The NESHAP applies to sources in specifically regulated industrial source categories (Clean Air Act Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type.

The Bucks Sawmill is classified as a major source of HAP emissions. The determination of applicability to NESHAP requirements for the proposed project is detailed in the following sections. Rules that are specific to certain source categories are not discussed in this regulatory review.

4.4.1 40 CFR 63 Subpart A – General Provisions

40 CFR 63 Subpart A, *General Provisions*, contains national emission standards for HAP defined in Section 112(b) of the Clean Air Act. All affected sources, which are subject to another NESHAP in 40 CFR 63, are subject to the general provisions of NESHAP Subpart A, unless specifically excluded by the source-specific NESHAP.

4.4.2 40 CFR 63 Subpart DDDD – Plywood and Composite Wood Products

NESHAP Subpart DDDD regulates HAP emissions from plywood and composite wood products (PCWP) manufacturing facilities that are major HAP sources. The PCWP MACT was initially finalized by U.S. EPA on July 30, 2004, and was reissued and amended after reconsideration on February 16, 2006. The rule was partially vacated and remanded by the D.C. Circuit Court of Appeals in June 2007, which led to the rule being finalized in October 2007.

Lumber kilns are process units within the existing “affected source” under the PCWP MACT, defined in 40 CFR 63.2232(b) as

The collection of dryers, refiners, blenders, formers, presses, board coolers, and other process units associated with the manufacturing of plywood and composite wood products. The affected source includes, but is not limited to, green end operations, refining, drying operations (including any combustion unit exhaust stream routinely used to direct fire process unit(s)), resin preparation, blending and forming operations, pressing and board cooling operations, and miscellaneous finishing operations (such as sanding, sawing, patching, edge sealing, and other finishing operations not subject to other national emission standards for hazardous air pollutants (NESHAP)). The affected source also includes onsite storage and preparation of raw materials used in the manufacture of plywood and/or composite wood products, such as resins; onsite wastewater treatment operations specifically associated with plywood and composite wood products manufacturing; and miscellaneous coating operations (§63.2292). The affected source includes lumber kilns at PCWP manufacturing facilities and at any other kind of facility.

However, based on §63.2252, for process units not subject to the compliance options or work practice requirements specified in §63.2240 (including, but not limited to, lumber kilns), the facility is not required to comply with the compliance options; work practice requirements; performance testing; monitoring; startup, shutdown, and malfunction (SSM) plans; and recordkeeping or reporting requirements of Subpart DDDD, or any other requirements in NESHAP Subpart A, *General Provisions*, except for the initial notification requirements in §63.9(b). Although the lumber kilns are an affected source, there are no applicable requirements for the direct-fired continuous kilns at the mill, except for the initial notification.

Pursuant to 40 CFR 63.9(b)(iii), affected sources may use the application for approval of construction to fulfill the initial notification requirements. Canfor has elected to use this application as initial notifications for each CDK.

4.4.3 40 CFR 63 Subpart DDDDD – Industrial, Commercial, and Institutional Boilers and Process Heaters

NESHAP Subpart DDDDD, *National Emissions Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters* (Major Source Boiler MACT) regulates

boilers and process heaters at major sources of HAP. The kilns do not meet the definition of a boiler or process heater. A process heater is defined in 40 CFR 63.7575, as

... an enclosed device using controlled flame, and the unit's primary purpose is to transfer heat indirectly to a process material (liquid, gas, or solid) or to a heat transfer material (e.g., glycol or a mixture of glycol and water) for use in a process unit, instead of generating steam. Process heaters are devices in which the combustion gases do not come into direct contact with process materials. A device combusting solid waste, as defined in §241.3 of this chapter, is not a process heater unless the device is exempt from the definition of a solid waste incineration unit as provided in section 129(g)(1) of the Clean Air Act. Process heaters do not include units used for comfort heat or space heat, food preparation for on-site consumption, or autoclaves. Waste heat process heaters are excluded from this definition.

The continuous lumber kilns will be direct-fired, as the combustion gases from the fuel will directly contact the lumber during the drying process. Therefore, the new lumber kilns are not considered process heaters, and Boiler MACT is not applicable.

4.4.4 40 CFR 63 Subpart JJJJJ – Industrial, Commercial, and Institutional Boilers at Area Sources

The Bucks Sawmill is a major source of HAP. Furthermore, even if the mill were an area source of HAP, the kiln burners are direct-heating units and do not meet the rule's definition of a boiler or process heater. Therefore, this rule does not apply.

4.4.5 NESHAP Subpart ZZZZ– Stationary Reciprocating Internal Combustion Engines

NESHAP Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, applies to stationary reciprocating combustion engines (RICE) at a major or area source of HAP emissions. At major sources, engines for which construction commenced on or after June 12, 2006, are considered new stationary RICE.¹² The diesel-fired emergency fire pump engine (ENG1) and the three (3) natural gas-fired emergency generators (GEN1, GEN2, GEN3) are considered new stationary RICE under NESHAP Subpart ZZZZ.

Per 40 CFR 63.6590(c), a new emergency stationary RICE with a site rating of less than or equal to 500 brake hp located at a major source of HAP emissions must meet the requirements of NESHAP Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII for compression ignition ICEs and Subpart JJJJ for spark ignition ICEs. No further requirements apply for such engines under the RICE MACT. New South will comply with applicable requirements under NSPS Subpart IIII and Subpart JJJJ as outlined above.

Pursuant to 40 CFR 63.9(b)(2)(i) through (v), New South has no additional requirements under this subpart. The engines operate exclusively as emergency stationary RICE having a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions. New South will comply with applicable requirements under NSPS Subpart IIII and JJJJ as detailed in Section 4.3.4 and 4.3.5.

¹² 40 CFR 63.63.6590(a)(1)(ii) and (a)(2)(ii).

4.4.6 40 CFR 63 Subpart CCCCCC – Gasoline Dispensing Facilities

40 CFR 63 Subpart CCCCCC, *National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities*, regulates HAP emissions from the loading of gasoline storage tanks at gasoline dispensing facilities (GDF) that are located at an area source of HAP. The Bucks Sawmill is a major source of HAP. Therefore, this rule does not apply.

4.4.7 Non-Applicability of All Other NESHAP

NESHAP are developed for particular industrial source categories. The applicability of a particular NESHAP to the proposed project can be readily ascertained based on the industrial source category covered. All other NESHAP are categorically not applicable to the proposed project.

4.5 Compliance Assurance Monitoring

Under 40 CFR 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emissions units with the initial or renewal Title V operating permit application. The CAM Plans are intended to provide an on-going and reasonable assurance of compliance with emission limits. Under the general applicability criteria, this regulation only applies to emission units that use a control device to achieve compliance with an emission limit and whose pre-controlled emission levels exceed the major source thresholds under the Title V operating permit program. For a subject unit, whose post-controlled emissions also exceed the major source threshold, a CAM plan is required to be submitted with the initial Title V operating permit application for the pollutant that exceeds the major source threshold. For a subject unit, whose post-control emission are less than the major source threshold, a CAM plan does not have to be submitted until the first renewal application.

The fuel silos utilize cyclones to control PM emissions. The uncontrolled emissions for the fuel silos are greater than the major source thresholds, while the controlled emissions are less than the major source thresholds under the Title V Program. Therefore, CAM would apply to the fuel silo cyclones. The planer mill will utilize a cyclone and baghouse system to control PM emissions. The uncontrolled emissions for the planer mill are greater than the major source thresholds, while the controlled emissions are less than the major source thresholds under the Title V Program. CAM does apply to the planer mill. New South is including proposed monitoring in Appendix G. No other emission units will utilize a control device at the facility. Therefore, CAM regulations will be applicable to the Bucks Sawmill. New South will develop and submit an initial CAM Plan with the first Title V Permit renewal application.

4.6 State Regulatory Requirements

In addition to federal air regulations, the ADEM Admin. Code R. 335-3, updated February 12, 2024, establishes regulations applicable for the Bucks Sawmill. ADEM rules potentially applicable to the facility are detailed in the following sections.

4.6.1 ADEM Admin. Code R. 335-3-4-.01 – Visible Emissions

ADEM Admin. Code R. 335-3-4-.01 restricts visible emissions from any source of particulate emissions to 20 percent with not more than one 6-minute period of up to 40 percent opacity per 60-minute period. This regulation also details monitoring requirements and work practice standards. All emission units proposed for the Bucks Sawmill are or will be subject to this rule.

4.6.2 ADEM Admin. Code R. 335-3-4-.02 – Fugitive Dust and Fugitive Emissions

ADEM Admin. Code R. 335-3-4-3-.02 requires usage of reasonable precautions to minimize fugitive dust and fugitive emissions from sources such as roadways. New South will take the appropriate precautions to prevent fugitive dust from becoming airborne.

4.6.3 ADEM Admin. Code R. 335-3-4-.03 – PM from Fuel Burning Equipment

ADEM Admin. Code R. 335-3-4-3-.03 regulates PM emissions from fuel burning equipment. Per 335-3-1-.02(ee), fuel burning equipment is defined as:

...any equipment, device, or contrivance and all appurtenances thereto, including ducts, breechings, fuel-feeding equipment, ash removal equipment, combustion controls, stacks, and chimney, 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.

Although the continuous lumber drying kilns are fuel-burning units, the units do not serve as indirect heating equipment. Therefore, the kilns are not subject to this rule.

4.6.4 ADEM Admin. Code R. 335-3-4-.04 – PM from Process Industries

This regulation limits particulate emissions from manufacturing processes in Class I and Class II Counties. The Bucks Sawmill is in Mobile County which is classified as a Class II County. However, pursuant to ADEM Admin. Code R. 335-3-4-.04(5), new sources shall be subject to the same requirements for facilities located in Class I counties. As such, the maximum allowable PM emissions for units at the mill are determined using the following equations:

$$E = 3.59 P^{0.62}, \text{ where } P < 30 \text{ tons/hr}$$

$$E = 17.31 P^{0.16}, \text{ where } P \geq 30 \text{ tons/hr}$$

where:

$$E = \text{allowable particulate emissions [lb/hr]}$$

$$P = \text{process weight rate [tons/hr]}$$

This regulation applies to all process emission sources at the mill that do not have a unit-specific PM or PM₁₀ emission limit. New South will comply with this rule by proper operation of the units.

4.6.5 ADEM Admin. Code R. 335-3-5-.01 – SO₂ from Fuel Combustion

This regulation limits emissions of SO₂ from fuel burning units in Category I and Category II Counties. The Bucks Sawmill is in a Category II County, which restricts SO₂ emissions from the mill's fuel burning equipment sources to 4.0 lb/MMBtu. However, as stated previously, the lumber drying kilns do not meet the definition of "fuel burning equipment" as they are direct-fired units. Additionally, the engines do not meet the definition of fuel burning equipment. Therefore, no emission units at the Bucks Sawmill will be subject to this limitation.

4.6.6 ADEM Admin. Code R 335-3-6-.01 through .53 – VOC Emissions

Chapter 335-3-6, Sections .01 through .53 addresses the control of organic emissions from specific manufacturing processes, including bulk gasoline terminals, surface coating, and coke by-product recovery

plants. The Bucks Sawmill does not operate any of the manufacturing processes included in 335-3-6, and therefore is not applicable to any emission limits or VOC standards set forth in ADEM Admin. Code R 335-3-6.

4.6.7 ADEM Admin. Code R 335-3-6-.04 – Fixed-Roof Petroleum Liquid Storage Vessels

Chapter 335-3-6-.04 addresses the control of organic emissions from petroleum liquid storage vessels. The rule applies to fixed roof storage tanks with capacities greater than 150,000 liters (40,000 gallons) containing a petroleum liquid whose true vapor pressure is greater than 10.5 kPa (1.52 psia). All petroleum liquid storage tanks at the Bucks Sawmill have storage capacities much smaller than 40,000 gallons. Therefore, this rule does not apply.

4.6.8 ADEM Admin. Code R 335-3-6-.07 – Gasoline Dispensing Facilities – Stage I

AAC 335-3-6-.07 addresses the control of organic emissions from gasoline dispensing facilities – Stage I. The rule applies to all gasoline dispensing facilities that commence construction after October 1, 1990 unless it meets one of the exceptions provided. In AAC 335-3-6-.07(2)(d), except any new or modified existing facility, regardless of tank upgrade, with an actual or expected throughput of gasoline of less than 4,000 gallons per month for the months of June, July, and August during full operation, provided that all gasoline storage tanks that are not exempted under subparagraphs (a), (b), and (c) of this paragraph are equipped with a submerged fill pipe. New South operates a stationary gasoline storage tank of 350 gallons with a submerged fill pipe. Therefore, this regulation does not apply.

4.6.9 ADEM Admin. Code R. 335-3-10 – Standards of Performance for New Stationary Sources

ADEM Admin. Code R. 335-3-10 incorporates Federal Regulations of 40 CFR Part 60. The facility is subject to the provisions of NSPS Subpart IIII and Subpart JJJJ; therefore subject to ADEM Admin. Code R. 335-3-10.

4.6.10 ADEM Admin. Code R. 335-3-11 – National Emission Standards for Hazardous Air Pollutants

ADEM Admin. Code R. 335-3-11 incorporates Federal Regulations of 40 CFR Parts 61 and 63 by reference. The facility is subject to NESHAP Subpart DDDD as detailed in Section 4.4.2.

4.6.11 ADEM Admin. Code R. 335-3-14-.04 – PSD Permitting

The Bucks Sawmill is a major PSD source and New South has evaluated PSD permitting applicability for the facility as detailed in Section 4.1.

4.6.12 ADEM Admin. Code R. 335-3-16. – Major Source Operating Permit

The Bucks Sawmill is a major stationary source as detailed in Section 4.2.

4.6.13 Non-Applicability of Other ADEM Air Regulations

A thorough examination of the ADEM Admin. Code R. applicability to the proposed project reveals many state regulations that do not apply and do not impose additional requirements on operations. Such rules include those specific to a particular type of industrial operation which are not related to the proposed project.

5. BACT ANALYSIS METHODOLOGY

This section discusses the regulatory basis for BACT, the approach used in completing the BACT analyses, and the BACT analyses for the proposed facility. Based on the BACT review, New South has determined that the technology and limits presented in Table 5-1 are BACT for the proposed emission units.

Table 5-1. Summary of Proposed BACT Limits

Unit	Pollutant	Selected BACT	Emissions/ Operating Limit	Compliance Method
Continuous Kilns	VOC	Proper Maintenance and Operating Practices	4.75 lb/MBF (All kilns)	Recordkeeping
	GHG	Optimum Combustion Fuel Selection Good Design and Operating Practices	Rolling 12-month basis 36,827 tpy (Biomass) 23,080 tpy (Natural gas)	Recordkeeping
Emergency Fire Pump	VOC	Good Combustion Practices Limiting Operating Hours	2.47E-03 lb/HP-hr	Recordkeeping
	GHG	Optimum Combustion Fuel Selection Good Design and Operating Practices	1.15 lb/HP-hr	Recordkeeping
Emergency Generator Engines	VOC	Good Combustion Practices Limiting Operating Hours	0.12 lb/HP-hr	Recordkeeping
	GHG	Optimum Combustion Fuel Selection Good Design and Operating Practices	110.1 lb/MMBtu	Recordkeeping

5.1 BACT REQUIREMENTS

The BACT requirement applies to each new or modified emission unit from which there is an emissions increase of pollutants subject to PSD review. New South has determined that the facility and proposed project are subject to PSD permitting for VOC and GHG, and thus, subject to BACT for these pollutants.

The following emission units and pollutants were considered in the BACT analysis and detailed discussions of each source type are included in the sections below:

- ▶ Four (4) Direct-Fired Continuous Kilns: VOC and GHG
- ▶ Emergency Fire Pump: VOC and GHG
- ▶ Three (3) Emergency Generators: VOC and GHG

5.2 BACT DEFINITION

For new major stationary sources, the requirement to conduct a BACT analysis is set forth in ADEM Admin Code R. 335-3-14-.04(9)(b):¹³

(9) Control Technology Review.

(b) A new major stationary source shall apply BACT for each regulated NSR pollutant that it would have the potential to emit in significant amounts.

BACT is defined in ADEM Admin Code R. 335-3-14-.04(2)(l)] as:

*Best Available Control Technology (BACT) shall mean an **emissions limitation** (including a visible emission standard) based on the maximum degree of reduction for **each regulated NSR pollutant** which would be emitted from any proposed major stationary source or major modification which the Director, 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 BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61.***

[primary BACT definition]

*If the Director 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 BACT.** 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.*

[allowance for secondary BACT standard under certain conditions]

The key areas of this definition are addressed further.

5.2.1 Emission Limitation

BACT is “an emission limitation,” not an emission reduction rate or a specific technology. BACT is determined on a case-by-case basis and therefore does not require the installation of any specific control device. While BACT is prefaced upon the application of technologies reflecting the maximum reduction rate achievable, the final result of BACT is an emission limit. Typically when quantifiable and measurable, this limit would be expressed as an emission rate limit of a pollutant (e.g., lb/ton, ppm, or lb/hr).¹⁴ Furthermore, EPA’s guidance on GHG BACT has indicated that GHG BACT limitations should be averaged over long-term timeframes such as 30- or 365-day rolling averages.¹⁵ It should be noted that the secondary BACT definition identifies that in cases where the implementation of an emission limitation is deemed infeasible, a design, equipment, work practice, operational standard or combination of may be prescribed as a BACT standard.

¹³ ADEM has been delegated authority by U.S. EPA to implement this federal permitting program.

¹⁴ Emission limits can be broadly differentiated as “rate-based” or “mass-based.”

¹⁵ *PSD and Title V Permitting Guidance for Greenhouse Gases*. March 2011, page 46.

5.2.2 Each Air Pollutant

In ADEM Admin Code R. 335-3-14-.04(2)(ww), ADEM clarifies:

(ww) "Regulated NSR pollutant," for purposes of this Rule, shall mean the following:
1. Any pollutant for which a national ambient air quality standard has been promulgated and any constituents or precursors for such pollutants identified by the Administrator of EPA (e.g., volatile organic compounds and NO_x are precursors for ozone);

5.2.3 Achievable

BACT is to be set at the lowest value that is achievable. However, there is an important distinction between emission rates achieved at a specific time on a specific unit, and an emission limitation that a unit must be able to meet continuously over its operating life.

As discussed by the DC Circuit Court of Appeals,

In National Lime Ass'n v. EPA, 627 F.2d 416, 431 n.46 (D.C. Cir. 1980), we said that where a statute requires that a standard be "achievable," it must be achievable "under most adverse circumstances which can reasonably be expected to recur."¹⁶

U.S. EPA has reached similar conclusions in prior determinations for PSD permits.

Agency guidance and our prior decisions recognize a distinction between, on the one hand, measured 'emissions rates,' which are necessarily data obtained from a particular facility at a specific time, and on the other hand, the 'emissions limitation' determined to be BACT and set forth in the permit, which the facility is required to continuously meet throughout the facility's life. Stated simply, if there is uncontrollable fluctuation or variability in the measured emission rate, then the lowest measured emission rate will necessarily be more stringent than the "emissions limitation" that is "achievable" for that pollution control method over the life of the facility. Accordingly, because the "emissions limitation" is applicable for the facility's life, it is wholly appropriate for the permit issuer to consider, as part of the BACT analysis, the extent to which the available data demonstrate whether the emissions rate at issue has been achieved by other facilities over a long term.¹⁷

Thus, BACT must be set at the lowest feasible emission rate recognizing that the emission unit must be in compliance with that limit for the lifetime of the unit on a continuous basis. While viewing individual unit performance can be instructive in evaluating what BACT might be, any actual performance data must be viewed carefully, as rarely will the data be adequate to truly assess the performance that a unit will achieve during its entire operating life. While statistical variability of actual performance can be used to infer what is "achievable," such testing requires a detailed test plan akin to what teams in U.S. EPA use to develop MACT standards over a several year period, and is far beyond what is reasonable to expect of an individual source.

¹⁶ As quoted in Sierra Club v. U.S. EPA (97-1686).

¹⁷ U.S. EPA Environmental Appeals Board decision, In re: Newmont Nevada Energy Investment L.L.C. PSD Appeal No. 05-04, decided December 21, 2005. Environmental Administrative Decisions, Volume 12, Page 442.

In contrast to limited snapshots of actual performance data, emission limits from similar sources can reasonably be used to infer what is “achievable.”¹⁸

5.2.4 Floor

Emissions [shall not] exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61.

The least stringent emission rate allowable for BACT is any applicable limit under either New Source Performance Standards (NSPS – Part 60) or National Emission Standards for Hazardous Air Pollutants (NESHAP – Parts 61 and 63).¹⁹ State SIP limitations must also be considered when determining the floor. The continuous kilns undergoing BACT are not subject to any NSPS or NESHAP emission limits for VOC. While a NESHAP exists that regulates HAP emissions from PCWP sources, lumber kilns are not subject to any numerical HAP limitations or work practice standards that could be considered BACT for VOC.

5.3 BACT “TOP-DOWN” APPROACH

The primary document referenced for the traditional “top-down” BACT methodology is U.S. EPA’s 1990 *NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting*.²⁰ The following sections present the top-down BACT analysis for each pollutant for which this project triggers PSD and is specific to each emission unit, unless otherwise specified. The five steps in such an evaluation can be summarized as follows:²¹

- ▶ **Step 1.** Identify all possible control technologies;
- ▶ **Step 2.** Eliminate technically infeasible control options;
- ▶ **Step 3.** Rank technically feasible control technologies based upon emission reduction potential;
- ▶ **Step 4.** Evaluate ranked control technologies based on energy, environmental, and/or economic considerations; and
- ▶ **Step 5.** Select BACT.

This process is typically conducted on a unit-by-unit, pollutant-by-pollutant basis. While the top-down BACT analysis is a procedural approach suggested by U.S. EPA policy, this approach is not specifically mandated as a statutory requirement of the BACT determination. BACT for the proposed project has been evaluated via this “top-down” approach.

5.3.1 Identification of Potential Control Technologies (Step 1)

Available control technologies with the practical potential for application to the emission unit are identified. The application of demonstrated control technologies in other similar source categories to the emission unit in question can also be considered. While identified technologies may be eliminated in subsequent steps in the analysis based on technical and economic infeasibility or environmental, energy, economic or other

¹⁸ Emission limits must be used with care in assessing what is “achievable.” Limits established for facilities which were never built must be viewed with care, as they have never been demonstrated and that company never took a significant liability in having to meet that limit. Likewise, permitted units which have not yet commenced construction must also be viewed with special care for similar reasons.

¹⁹ While not specified as the BACT floor, NESHAP under 40 CFR 63 sometimes regulate NSR pollutants as a surrogate for non-NSR pollutants.

²⁰ U.S. EPA, October 1990. <https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf>.

²¹ This five-step process can be directly applied to GHGs without any significant modifications, per *PSD and Title V Permitting Guidance for Greenhouse Gases*.

impacts, control technologies with potential application to the emission unit under review are identified in this step. Under Step 1 of a criteria pollutant BACT analysis, the following resources are typically consulted when identifying potential technologies:

1. U.S. EPA's RBLC database
2. Determinations of BACT by regulatory agencies for other similar sources or air permits and permit files from federal or state agencies
3. Engineering experience with similar control applications
4. Information provided by air pollution control equipment vendors with significant market share in the industry
5. Review of literature from industrial technical or trade organizations

Trinity performed searches of the RBLC database in September 2025 and to identify the emission control technologies and emission levels that were determined by permitting authorities as BACT within the past ten years for emission sources comparable to the proposed project. The following categories were searched:

- ▶ Permit Data between 01/01/2015 and 09/22/2025
- ▶ Process Type:
 - Wood Lumber Kilns (RBLC Code 30.800)
 - Diesel Internal Combustion Engine (<500 hp) Sources (RBLC Code 17.210)
 - Natural Gas Internal Combustion Engines (<500 hp) Sources (RBLC Code 17.230)
- ▶ Process Keywords: Kilns (for VOC, CO₂, CO₂e, Methane, and N₂O); Other Sources (for VOC, CO₂, CO₂e, Methane, and N₂O).
- ▶ Results are for USA

Appendix C presents summary tables of relevant BACT determinations for the proposed emission units.

5.3.2 Elimination of Technically Infeasible Control Options (Step 2)

After the available control technologies have been identified, each technology is evaluated with respect to its technical feasibility in controlling emissions from the source in question. The first question in determining whether or not a technology is feasible is whether or not it is demonstrated. If so, it is feasible. Whether or not a control technology is demonstrated is considered to be a relatively straightforward determination.

5.3.2.1 Demonstrated Technology

Demonstrated means that it has been installed and operated successfully elsewhere on a similar facility. If the control technology has been installed and operated successfully on the type of source under review, it is demonstrated and it is technically feasible.²²

5.3.2.2 Emerging and Undemonstrated Technology

An undemonstrated technology is only technically feasible if it is "available" and "applicable." A control technology or process is only considered available if it has reached the licensing and commercial sales phase of development and is "commercially available."²³ Control technologies in the R&D and pilot scale phases are not considered available. Based on U.S. EPA guidance, an available control technology is presumed to be applicable if it has been permitted or actually implemented by a similar source. Decisions about technical

²² NSR Workshop Manual (Draft), Prevention of Significant Deterioration and Nonattainment New Source Review Permitting, page B.17.

²³ Ibid, page B.18.

feasibility of a control option consider the physical or chemical properties of the emissions stream in comparison to emissions streams from similar sources successfully implementing the control alternative. The NSR Manual explains the concept of applicability as follows: "An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration."²⁴ Applicability of a technology is determined by technical judgment and consideration of the use of the technology on similar sources as described in the NSR Manual.

5.3.3 Rank of Remaining Control Technologies (Step 3)

All remaining technically feasible control options are ranked based on their overall control effectiveness for the pollutant of interest.

5.3.4 Evaluation of Most Stringent Control Technologies (Step 4)

After identifying and ranking available and technically feasible control technologies, the economic, environmental, and energy impacts are evaluated to select the best control option. If adverse collateral impacts do not disqualify the top-ranked option from consideration it is selected as the basis for the BACT limit. Alternatively, in the judgment of the permitting agency, if unreasonable adverse economic, environmental, or energy impacts are associated with the top control option, the next most stringent option is evaluated. This process continues until a control technology is identified.

Economic analyses were performed to compare total costs (capital and annual) for potential control technologies. Capital costs include the initial cost of the components intrinsic to the complete control system. Annual operating costs include the financial requirements to operate the control system on an annual basis and include overhead, maintenance, outages, raw materials, and utilities.

The capital cost estimating technique used is based on a factored method of determining direct and indirect installation costs. That is, installation costs are expressed as a function of known equipment costs. This method is consistent with the latest U.S. EPA OAQPS guidance manual on estimating control technology costs.²⁵

Total Purchased Equipment Cost represents the delivered cost of the control equipment, auxiliary equipment, and instrumentation. Auxiliary equipment consists of all the structural, mechanical, and electrical components required for the efficient operation of the device. Auxiliary equipment costs are estimated as a straight percentage of the equipment cost. Direct installation costs consist of the direct expenditures for materials and labor for site preparation, foundations, structural steel, erection, piping, electrical, painting and facilities. Indirect installation costs include engineering and supervision of contractors, construction and field expenses, construction fees, and contingencies. Other indirect costs include equipment startup, performance testing, working capital, and interest during construction.

Annual costs are comprised of direct and indirect operating costs. Direct annual costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal. Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges. Replacement part costs, such as the cost of a replacement catalyst, were included where applicable, while raw material costs were estimated based upon the unit cost and annual consumption. With the exception of overhead, indirect operating costs

²⁴ Ibid, page B.18.

²⁵ U.S. EPA, *OAQPS Control Cost Manual*, 6th edition, EPA 452/B-02-001, July 2002.

http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf Note that updates sections of the manual relate to NO_x controls and are not utilized herein. For more details on the updating of the control cost manual see:

<https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution>

were calculated as a percentage of the total capital costs. The indirect capital costs were based on the capital recovery factor (CRF) defined as:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where i is the annual interest rate and n is the equipment life in years.

The equipment life is based on the normal life of the control equipment and varies on an equipment type basis. The same interest applies to all control equipment cost calculations. For this analysis, an interest rate of 4.25% was used based on information provided in the most recent OAQPS Control Cost Manual.²⁶ Detailed BACT cost calculations are included in Appendix D to this report.

5.3.5 Selection of BACT (Step 5)

In the final step, the BACT emission limit is determined for each emission unit under review based on evaluations from the previous step.

Although the first four steps of the top-down BACT process involve technical and economic evaluations of potential control options (i.e., defining the appropriate technology), the selection of BACT in the fifth step involves an evaluation of emission rates achievable with the selected control technology. BACT is an emission limit unless technological or economic limitations of the measurement methodology would make the imposition of an emissions standard infeasible, in which case a work practice or operating standard can be imposed.

5.4 DEFINING THE SOURCE

To assist in meeting the BACT limit, the source must consider production processes or available methods, systems, or techniques, as long as those considerations do not redefine the source. New South is proposing to construct a lumber mill which consists of the installation and operation of three new direct-fired continuous lumber kilns, log preparation, material transfer, and road travel.

The new equipment to be installed as part of the proposed project at the Bucks Sawmill includes the following:

- ▶ Two (2) biomass direct-fired continuous kilns each with the capacity to produce 92.5 MMBF/yr dried lumber and burner size of 40 MMBtu/hr, and associated abate stacks
- ▶ Two (2) natural gas direct-fired continuous kilns each with the capacity to produce 100 MMBF/yr dried lumber and burner size of 45 MMBtu/hr
- ▶ One (1) 305-hp diesel-fired Emergency Fire Pump Engine
- ▶ Two (2) 54-hp natural gas-fired Emergency Generators
- ▶ One (1) 69-hp natural gas-fired Emergency Generator

The BACT selections are based on these design constraints, and any potential control methods that would require New South to redefine these sources has been explained as such and were not considered further.

²⁶ U.S. EPA, OAQPS Control Cost Manual, 6th edition, Section 2, Chapter 1, page 1-52.
http://www.epa.gov/ttn/catc/dir1/c_allchs.pdf

6. LUMBER DRYING KILNS VOC ASSESSMENT

This section contains a review of pollutant formation, possible control technologies, and the ranking and selection of such controls with associated emission limits, for proposed BACT on VOC emissions from the continuous lumber drying kilns. The following sections contain details on what would be considered the “top-down” BACT review, as well as the likely control technology and emission limits that would need to be selected for VOC.

6.1 Identification of Potential Control Technologies – Lumber Drying Kilns (Step 1)

Candidate control options identified from the RBLC search and the literature review include those classified as pollution reduction techniques. VOC reduction options include:

- ▶ Adsorption
- ▶ Biofiltration
- ▶ Condensation
- ▶ Thermal Oxidation
- ▶ Wet Scrubbing
- ▶ Proper Maintenance and Operating Practices

These control technologies are briefly described in the following sections.

6.2 Technically Infeasible VOC Controls – Lumber Drying Kilns (Step 2)

After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. The following sections evaluate the feasibility of the above-mentioned control technologies for reducing VOC emissions from the proposed continuous kiln. Note that, based on a review of both batch and continuous lumber drying kilns in the U.S. EPA’s RBLC database, a control device has never been applied to a lumber drying kiln.

6.2.1 Adsorption

The kiln exhaust contains the water vapor that has evaporated from the lumber as it is dried and will have a relative humidity over 100%. At high moisture contents, the water molecules and hydrocarbons in the exhaust stream will compete with each other for active adsorption site, reducing the efficiency of the adsorption system. This control device is, therefore, deemed technically infeasible.

6.2.2 Biofiltration

The microorganisms used in biofiltration cannot survive at temperatures exceeding 105 °F; however, the temperature of the exhaust stream from the kiln will be approximately 215 °F. Furthermore, the primary constituent of the VOC in the exhaust stream is terpenes, which are highly viscous and would cause the biofilter to easily foul. Because of the nature of the long-chained hydrocarbons in the exhaust stream, a biofilter with a reasonable footprint/retention time, will have a reduced control efficiency relative to a unit treating streams with large concentrations of methanol or formaldehyde. The microorganisms require a much longer retention time/size of a unit in order to provide an increased efficiency. For example, engineering firms

have previously noted that to increase the control efficiency an additional 5% at these removal levels would essentially require a biofilter twice as large. This control device is therefore deemed technically infeasible.

6.2.3 Condensation

Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to be lower than the VOC concentration. The primary constituent of the VOC in the exhaust stream from the lumber kiln is terpenes, which would require the temperature of the exhaust stream to be lowered to well below 0 °F in order to have a low enough vapor pressure to use condensation. Temperatures this low would cause the water vapor in the stream to freeze, and the ice would clog the unit. As such, condensation is not a technically feasible control technology.

6.2.4 Thermal Oxidation

The high moisture content and low exit temperature of the exhaust stream would likely make an RTO technically infeasible. While regenerative catalytic oxidizers (CatOx) can operate at lower temperatures than the RTO, the exit temperature of the exhaust stream from the kiln is still too low for this option to be feasible. Furthermore, the particulate matter and other contaminants in the exhaust stream would cause a loss of catalytic activity. Also, the low temperature of the exhaust stream precludes the system from using a CatOx system for VOC control.

Based on the reasons stated above and the fact that there were no lumber drying kilns, batch or continuous, in the RBLC database or the air permit file review that utilized thermal oxidation, New South may eliminate thermal oxidation from consideration based on technical infeasibility. However, New South is, for conservatism, further considering an RTO in the future steps for the BACT determination to determine what the economic and environmental impact from the use of an RTO would be in the situation that it is technically feasible with this type of unit (a point which New South does not concede).

6.2.5 Wet Scrubbing

While some VOCs that will be present in the exhaust stream are highly soluble in water, other VOCs, most notably α -pinene, are only very slightly soluble in water due to the lower Henry's Law constant as described in Perry's Chemical Engineer's Handbook. Lower Henry's Law constant VOCs would require much longer residence time within a scrubber packed column and would eliminate this as a technically viable solution for the constant stream that would need to be handled by a continuous kiln.

6.2.6 Proper Maintenance and Operating Practices

Proper maintenance and operating practices of the kiln is a technically feasible option for minimizing the VOC emissions from the kiln and will be considered further in the future steps for BACT determination.

6.3 Summary and Ranking of Remaining VOC Controls – Lumber Drying Kilns (Step 3)

Of the control technologies available for VOC emissions, the options technically feasible for each unit are shown in Table 6-1. As discussed in Step 2, New South does not concede that the use of an RTO on a lumber drying kiln is technically feasible; however, this control option is being evaluated in this and the future steps of the BACT determination for conservatism.

Table 6-1. Remaining VOC Control Technologies

Rank	Control Technology	Potential Control Efficiency (%)
1	RTO	98%
2	Proper Maintenance and Operating Practices	Base Case

6.4 Evaluation of Most Stringent VOC Controls – Lumber Drying Kilns (Step 4)

The fourth of the five steps in the top-down BACT assessment procedure is to evaluate the most effective control and document the results. This has been performed for the remaining control technologies on the basis of economic, energy, and environmental considerations, and is described herein.

6.4.1 Regenerative Thermal Oxidation

Even if the use of an RTO was technically feasible on a lumber drying kiln, the cost of using an RTO exceeds the benefit of the VOC reduction it offers. The current cost of controlling VOC with an RTO is estimated at approximately \$18,910 per ton of VOC removed for the biomass kilns and \$17,492 per ton of VOC removed for the natural gas kilns. This high cost for VOC control is largely due to the high moisture content of the kiln exhaust stream and low exhaust temperature, as heating water vapor in the exhaust stream to RTO operating temperatures significantly increases the natural gas heating requirement. There would also be associated energy and environmental impacts resultant from use of natural gas, including additional pollutant emissions such as NO_x from natural gas combustion.

6.4.2 Proper Maintenance and Operating Practices

The only remaining technology is proper maintenance and operating practices of the kiln, a logical option since a properly maintained and operated kiln can effectively minimize VOC formation. This control option is considered BACT for VOC for the continuous kilns.

6.5 Selection of VOC BACT – Lumber Drying Kilns (Step 5)

Based on steps 1 through 4 of the BACT analysis, New South has determined that proper maintenance and good operating practices are the only controls technically and economically feasible for the proposed continuous lumber drying kilns. All other potential control technologies were eliminated in earlier steps of the process. Therefore, New South proposes the emission rate of 4.75 lb for Total VOC as (terpene + methanol + formaldehyde)/MBF as BACT, calculated from the equation described below.

$$Total\ VOC = VOC\ as\ C \times 1.225 + (1 - 0.65) \times Methanol + Formaldehyde$$

The basis for the VOC factor is adjusted per EPA protocol from the traditional VOC as carbon to a total mass VOC basis. In order to comply with BACT, New South will develop an operating and maintenance plan for the new continuous kilns.

Appendix C contains the RBLC search results with listed emission factors in lb VOC per MBF. Of the factors listed, there is limited data and references available on how the VOC factor was derived and the appropriate

basis of the factor. Additionally, many of the emission factors listed are for batch kilns, as continuous kilns are still an emerging technology.

6.6 VOC BACT – Biomass-Fired Burner Abort Stacks

Each 40 MMBtu/hr biomass burner has an associated abort stack. The abort stacks are utilized during startup operations, venting directly to atmosphere, for approximately 48 non-consecutive hours per year. VOC emissions from the abort stacks have been estimated at 0.032 tpy, which accounts for approximately 0.0044% of the total VOC emissions from point sources. Due to the very low potential emissions associated with the abort stacks and the intermittent nature of the abort stack operations, methodologies for capturing and controlling the VOCs would be neither practical nor cost effective. New South has determined that proper maintenance and good operating practices are the only controls technically and economically feasible for the biomass burner abort stacks. New South proposes an emission rate of 0.017 lb/MMBtu for VOC and the tracking of operation hours as BACT.

7. EMERGENCY ENGINES VOC ASSESSMENT

This section contains a review of pollutant formation, possible control technologies, and the ranking and selection of such controls with associated emission limits, for proposed BACT on VOC emissions from the emergency engines. The following sections contain details on what would be considered the “top-down” BACT review, as well as the likely control technology and emission limits that would need to be selected for VOC.

7.1 Identification of All Available Control Technologies

Based on information obtained from USEPA’s RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential VOC controls for the emergency engines includes:

- ▶ Purchase of Certified NSPS IIII/JJJJ engine
- ▶ Good Combustion Practices
- ▶ Limitations on Hours of Operation

These control technologies are briefly described in the following sections.

7.2 Technically Infeasible VOC Controls – Emergency Engines

All of the potential control technologies discussed in Step 1 are technically feasible.

7.3 Summary and Ranking of Remaining VOC Controls – Emergency Engines

Purchase of certified NSPS IIII or NSPS JJJJ engines, good combustion practices, and limitations on hours of operation have an undefined control efficiency for VOC emissions.

7.4 Evaluation of Most Stringent VOC Controls – Emergency Engines

The emergency engines will have low emissions of VOC, compounded with the fact that they will be restricted to 100 hours per year of operation.

7.5 Selection of VOC BACT – Emergency Engines

Good combustion practices and limiting the operating hours for the emergency engines is proposed as BACT. Proposed BACT limits will be set to the emission limits required by NSPS Subpart IIII and Subpart JJJJ which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits are shown in Table 4-2.

8. GHG BACT EVALUATION

A site-wide GHG BACT evaluation is presented in this section.

8.1 BACT Step 1 – Identify All Control Technologies

New South researched CO₂ control technologies and developed the following list of potential options which are commonly reviewed in making BACT determinations that are included in the RBLC database:

- ▶ Carbon Capture and Storage
- ▶ Optimum Combustion Efficiency
- ▶ Fuel Selection
- ▶ Oxygen Enrichment/Oxy-Fuel Combustion
- ▶ Good Design and Operating Practices

Carbon Capture and Storage

An effective carbon, capture, and storage (CCS) system would require three elements:

- Separation technology for the CO₂ exhaust stream (i.e., “carbon capture” technology),
- Transportation of CO₂ to a storage site, and
- A viable location for long-term storage of CO₂.

These three elements work in series. Consequently, in order to execute a CCS program as BACT, all three elements must be “available.”

CO₂ Capture

CCS involves post-combustion capture of the CO₂ from the emission units and sequestration of the CO₂ in some fashion. Carbon capture is an established process in some industry sectors, although not in the wood products sectors. In theory, carbon capture could be accomplished with low pressure scrubbing of CO₂ from the exhaust stream with either solvents (e.g., amines and ammonia), solid sorbents, or membranes. However, only solvents have been used to-date on a commercial (slip stream) scale, and solid sorbents and membranes are only in the R&D phase.

CO₂ must be compressed from near-atmospheric pressure to pipeline pressure (around 2,000 psia) prior to transportation to an appropriate sequestration site. The compression of CO₂ requires a large auxiliary power load, resulting in the use of additional fuel (and additional CO₂ emissions) to generate this needed electricity.²⁷

CO₂ Transport

CO₂ that has been captured and compressed is subsequently transported to the site designated for long-term geologic storage or use in enhanced oil recovery (EOR). Pipelines are expected to be the most economical and efficient method of transporting CO₂ for commercial purposes. Once constructed, pipelines reduce uncertainty associated with logistics, fuel costs, and reliance on other infrastructure that could increase the cost of CO₂ transportation. The history of transporting CO₂ via pipelines in the United States spans over 40 years.

²⁷ EPA. (2010, August). Report of the Interagency Task Force on Carbon Capture and Storage. Retrieved from https://energy.gov/sites/prod/files/2013/04/f0/es_ccstf_2010_0.pdf

As of 2019, there were approximately 32 liquid CO₂ pipeline operators under USDOT regulatory authority in the United States according to the Pipeline and Hazardous Materials Safety Administration (PHMSA). This distribution network consists of approximately 5,200 miles of pipe transporting supercritical fluid CO₂ and a significantly smaller amount (~60 miles) of gas CO₂ pipelines.²⁸ Currently there are no CO₂ pipelines in the vicinity of the Bucks site.²⁹ A recent report delivered to Congress by the Council of Environmental Quality on CCS identifies priorities including the establishment of an interstate CO₂ pipeline network modeled by the Princeton Net-Zero America study covering portions of the Central States and Midwest regions, but there are no proposed routes in Alabama.³⁰ Therefore, CO₂ transportation infrastructure is not currently available for the Bucks Sawmill nor have any future plans for adding CO₂ transportation been proposed by a governmental or private sector entity within the initial operating period of the Bucks Sawmill.

CO₂ Storage

CO₂ storage refers to the process of injecting CO₂ into subsurface formations for long-term sequestration.³¹ CO₂ storage is currently happening across the U.S. and around the world. Large, commercial-scale projects, like the Sleipner CO₂ Storage Site in Norway, the Weyburn-Midale CO₂ Project in Canada, and the In Salah project in Algeria, have been injecting CO₂ for years. Each of these projects stores more than 1 million tons of CO₂ per year.³² Domestically, the US DOE has successfully completed two industrial "Major Demonstration" projects.³³

The Archer Daniels Midland project involves CO₂ capture and sequestration at a biofuels production plant in Decatur, Illinois. This project started commercial operations in April 2017, received an EPA Class VI UIC injection well permit for CO₂ storage, and, as of March 2021, successfully captured and stored over 2 million metric tons of CO₂.

The Air Products project started commercial operations in a Port Arthur, Texas, hydrogen production facility in March 2013. As of March 2021, the Air Products project has successfully captured nearly 7 million metric tons of CO₂ that is used for EOR.

CO₂ may also be injected into the ground for EOR. Underground CO₂ injection has been used successfully to boost production efficiency of oil and gas wells by re-pressurizing the reservoir, and in the case of oil, by increasing mobility.³⁴

²⁸ Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>

²⁹ U.S. DOE. (2015, April). A Review of the CO₂ Pipeline Infrastructure in the U.S. Retrieved from https://energy.gov/sites/prod/files/2015/04/f22/QR%20Analysis%20-%20A%20Review%20of%20the%20CO2%20Pipeline%20Infrastructure%20in%20the%20U.S_0.pdf

³⁰ Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>

³¹ EPA. (2010, August). Report of the Interagency Task Force on Carbon Capture and Storage. Retrieved from https://energy.gov/sites/prod/files/2013/04/f0/es_ccstf_2010_0.pdf

³² U.S. Department of Energy National Energy Technology Laboratory. (n.d.). Carbon Storage FAQ Information Portal: Carbon Storage. Retrieved from <https://netl.doe.gov/carbon-management/carbon-storage/faqs/carbon-storage-faqs>

³³ Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>

³⁴ *Ibid.*

There are no active carbon sequestration projects in South Alabama to assess the suitability of geology for permanent carbon storage. Therefore, there are no potential sites where CO₂ could be sequestered in the vicinity of the facility location. According to the recent report to Congress, the nearest storage sites (i.e., EOR fields with potential CO₂ demand and potential saline injection areas) would be in Southern Mississippi more than 60 miles from the Bucks Sawmill.³⁵ Since there are no potential sites where CO₂ could be used for EOR in the vicinity of the Bucks Sawmill, and there are currently no CO₂ pipelines which could transport compressed CO₂ to a region of the country (e.g., South Alabama) where it could be used for EOR, New South's evaluation of CCS technology assumes that the construction of a pipeline for the transport of CO₂ to a region where it could be used for EOR would be necessary.

While carbon capture technology may be technologically available on a small-scale, it has not been demonstrated in practice for wood product facilities. CCS is not commercially available as BACT at present for the proposed project, given the limited deployment of only slipstream/demonstration applications of CCS. Consequently, CCS is considered to be unavailable for all project combustion systems due to the lack of demonstrated technology and storage locations. Therefore, CCS has not been carried forward into subsequent steps of the BACT analysis for a representative emission unit in the Bucks Sawmill project scope.

Optimum Combustion Efficiency

GHGs are generated when combustible organics are oxidized. As such, typical add-on combustion controls for organic compound destruction are not considered to be GHG control options. Instead, GHG emissions from combustion units are minimized when highly efficient combustion devices are implemented that require less fuel usage to achieve the desired energy output. Therefore, GHG BACT considerations involve a review of high efficiency combustion equipment and technology options. By selecting a high efficiency combustion unit, GHG emissions are minimized.

Fuel Selection

The carbon intensity of fuels can vary significantly across available fossil fuels commonly used in industry. Fuels with low carbon intensity have lower GHG emissions than fuels with high carbon intensity. Therefore, GHG BACT considerations involve the evaluation of low carbon intensity fuel options. By selecting a low carbon fuel, GHG emissions are minimized. The use of pipeline quality natural gas as fuel is inherent to the proposed project. While the use of wood and wood residual biomass is not inherently low carbon, by finding a use on-site no additional transportation fuel use would lower the overall GHG emissions in the region. Per the general PSD guidance, control technologies that would fundamentally redefine the nature of the source do not need to be evaluated.

Oxygen Enrichment/Oxy-Fuel Combustion

A certain amount of air is required to provide sufficient oxygen for the combustion of fuel. Air is primarily made up of 78 percent (%) nitrogen, 21 percent (%) oxygen and 1 percent (%) argon and other gases. Oxygen Enrichment/Oxy-Fuel combustion is the substitution of oxygen for combustion air to burn the fuel in the furnace. Oxygen-enriched combustion refers to increasing the oxygen content of the air/oxygen mixture used for the combustion reactions to in the range of 21-35 percent.³⁶ Oxy-fuel combustion refers to entirely replacing the combustion air supply with 100 percent pure oxygen. Oxygen enrichment technology that

³⁵ Council on Environmental Quality Report to Congress on Carbon Capture, Utilization, and Sequestration (2021, June). Retrieved from <https://www.whitehouse.gov/wp-content/uploads/2021/06/CEQ-CCUS-Permitting-Report.pdf>

³⁶ Gangoli, Shailesh, et. al., *Oxy-Fuel Technologies and Strategies for Secondary Aluminum Melting Operations*, Light Metal Age, Reprinted by Air Products® 2017, available at <https://www.airproducts.expert/en/transient-heating-burner/pdf/en-metals-nonferrous-oxy-fuel-technologies-and-strategies-lma-article-2017.pdf>

supplements existing burner arrangements with oxygen lances, OxyBoost technology consisting of a system of supplementary oxy-fuel burners added to the existing burner arrangement, oxy-fuel technology using oxy-fuel burners (pure O₂ for combustion) as an alternative to traditional air-fuel burners, and air-oxy-fuel technology using air-oxy-fuel burners (combustion air enriched with O₂).

The use of oxygen-enriched or oxy-fuel combustion increases furnace efficiency by improving thermal efficiency and heat transfer. GHG emissions can be further minimized using various oxygen enrichment and oxyfuel strategies. These strategies improve efficiency by reducing or removing the N₂ portion of typical combustion air. Accordingly, a reduced volume of combustion air would be required to complete the combustion reaction, the flame temperature would increase, the available heat would increase, and the thermal efficiency of the system would be improved. However, while oxygen enrichment/oxy-fuel combustion has been successfully applied to some furnaces or burners in other industrial sectors, this technology is not considered to be available for the proposed lumber kiln burners in the specific application planned for Bucks Sawmill project. New South does not consider oxygen enrichment/oxy-fuel strategies to be available for New South's' proposed lumber production processes.

Good Design and Operating Practices

Good combustion design includes proper burner and unit design for the proposed combustion units. For both the biomass and natural gas burner attached to each lumber kiln, the exhaust gases must be in direct contact with the lumber being dried. Additionally, the doors to the kilns must remain open for operation. The design of the conditioning chambers of the kilns is utilized to transfer the heat produced and limit the amount of fuel required to complete the drying process. Good operating practices include good burner maintenance and operation and good air to fuel mixing to promote complete combustion. By operating a combustion unit as efficiently as possible, GHG emissions are minimized. As part of the normal operating practices, daily/weekly/monthly/and annual preventative maintenance practices will be performed according to the manufacturer's recommendations.

8.1.1 Available GHG Control Technologies for External Combustion Units

Available GHG control technologies are presented in the following sections for site-wide sources of GHGs, namely natural gas-fired combustion equipment. Table 8-1 identifies proposed sources of GHG emissions and provides each source's rated capacity and annual GHG emission rate on a CO₂ equivalent (CO₂e) basis.

Table 8-1. GHG Emissions from Combustion Sources

Emission Unit	Rated Capacity (Specified unit, each)	GHG Emission Rate (tpy, each)
Continuous Kiln No. 1 Biomass Buner No. 1	92.5 MMBF/yr 40 MMBtu/hr	36,827
Continuous Kiln No. 2 Biomass Buner No. 2	92.5 MMBF/yr 40 MMBtu/hr	36,827
Continuous Kiln No. 3 Natural Gas Burner No. 3	100 MMBF/yr 45 MMBtu/hr	23,080
Continuous Kiln No. 4 Natural Gas Burner No. 4	100 MMBF/yr 45 MMBtu/hr	23,080
Emergency Fire Pump Engine	305 HP 100 hr/yr	17.6
Emergency Generator No.1	54 HP 100 hr/yr	2.08
Emergency Generator No.2	54 HP 100 hr/yr	2.08
Emergency Generator No.3	69 HP 100 hr/yr	2.66

There are no NSPS or NESHAPs that can be used to establish a floor for GHG emission rates from these combustion sources.

Based on the findings in relevant sections of Appendix C, no similar facilities or facilities with similar process types were identified in the RBLC as using any type of add-on control device. This finding is important and bolsters the conclusion that BACT should be represented by emission limits that do not account for the implementation of an add-on control device.

Based on a review of technical literature, past control technology determinations, and generally available technologies and practices, which could be potentially applied to control GHG emissions from New South’s combustion equipment are listed below and are presented in Section 8.2:

- ▶ Optimum Combustion Efficiency
- ▶ Fuel Selection
- ▶ Good Design and Operating Practices

8.1.2 Available GHG Control Technologies for Internal Combustion Emergency Engines

GHG emissions from emergency engines result from the oxidation of fuel carbon. This evaluation does not identify and discuss each of the five individual steps of the “top-down” BACT process as there are no post-combustion control technologies identified or available for GHG emissions from small emergency engines. The proposed BACT for GHG emissions from the emergency engines is to follow good combustion practices, the use of natural gas, limiting hours of operation and proper operation and maintenance consistent with NSPS Subpart IIII and JJJJ.

8.2 BACT Step 2 – Eliminate Technically Infeasible Control Options

8.2.1 Technically Feasible GHG Control Technologies

Optimum Combustion Efficiency

Optimum combustion unit efficiency is a technically feasible consideration for all of New South’s proposed combustion equipment and is incorporated into the unit design.

Fuel Selection

Fuel selection is a technically feasible consideration for combustion equipment and is incorporated into the process design. New South’s proposed combustion sources will combust biomass, diesel fuel, or natural gas, which are low carbon intensity fuels. The low carbon intensity of natural gas is demonstrated in Table 8-2, which shows CO₂ emission factors of various fuels on a heat input basis from EPA’s Greenhouse Gas Reporting Program (GHGRP).

Table 8-2. Emission Factors for Various Fuels

Fuel Type	Default CO ₂ Emission Factor ^a (kg/MMBtu)
Natural Gas (Weight U.S. Average)	53.06
Propane Gas	61.46
Liquefied Petroleum Gas	61.71
Motor Gasoline	70.22
Distillate Fuel Oil No. 2	73.96
Distillate Fuel Oil No. 4	75.04
Kerosene	75.2
Coal - Bituminous	93.28
Wood and Wood Residuals (dry basis)	93.8
Coal - Subbituminous	97.17
Coal - Anthracite	103.69

a. 40 CFR 98 Subpart C, Table C-1 - Default CO₂ Emission Factors and High Heat Values for Various Types of Fuel

As illustrated by Table 8-2, natural gas produces lower CO₂ emissions per unit of heat input than all other commonly used fossil fuels. As CO₂ represents the vast majority of GHG emissions from fuel combustion, natural gas is considered to be the fossil fuel with the lowest carbon intensity. However, New South will be able to generate its own wood and wood residual fuel without additional cost or transportation needs. Therefore, New South will utilize diesel fuel, natural gas, and wood residuals as the fuel type for New South’s combustion equipment to represent BACT for GHG emissions.

Good Design and Operating Practices

New South will implement good combustion design and operating practices on each piece of combustion equipment. The various unit vendors have implemented design elements that promote complete combustion and efficiency. As such, these good operating practices include the optimization of energy efficiency.

8.3 BACT Step 3 – Rank Remaining Control Options by Effectiveness

8.3.1 Effectiveness Ranking of GHG Control Technologies

The remaining process design/work practice-focused control technologies do not have a readily definable GHG removal efficiency in the same sense as a conventional add-on control option for a non-GHG regulated NSR pollutant. Table 8-3 outlines the control technologies.

Table 8-3. Remaining Control Technologies Ranked by Effectiveness for GHG

Emission Unit	Control Technology	Control Efficiency
Combustion Equipment	Optimum Combustion Efficiency	Undefined
	Fuel Selection	Undefined
	Good Design and Operating Practices	Undefined

8.4 BACT Step 4 – Evaluate Most Effective Controls and Document Results

8.4.1 Economic, Environmental, and Energy Impacts of GHG Control Technologies

Since the remaining CO₂ control technologies are not mutually exclusive, New South has chosen to implement each of the remaining control options: optimum combustion efficiency, fuel selection, and good design and operating practices. There are no significant economic, environmental, or energy impacts associated with the selected control methods.

8.5 BACT Step 5 – Select BACT Limitations

8.5.1 BACT Selection of GHG Control Technologies

The proposed BACT determinations for GHG emissions from New South's proposed combustion equipment include Optimum Combustion Efficiency, Fuel Selection, and Good Design and Operating Practices. The annual GHG emission rates on a per emission unit basis previously listed in Table 8-1 are proposed as numerical GHG BACT limits in conjunction with the work practice standard requirements.

To ensure that GHG BACT requirements are satisfied, New South will install high-efficiency combustion equipment, combust only natural gas or wood residuals produced on-site, and implement good design and operating practices.

Compliance with the proposed GHG emission limits will be demonstrated by operating and maintaining the process units in accordance with the manufacturer's recommendations, instructions, and/or operating manual(s), with any modifications deemed necessary by New South. New South's proposed control method is consistent with the GHG BACT determinations that were identified in the RBLC and similar facility review

for similar emission sources. Therefore, no information is available which suggests that lower BACT limits have been established for GHG emissions from similar units.

9. ADDITIONAL IMPACTS ANALYSIS

In addition to the analyses described earlier, PSD regulations also require three additional impacts analyses: 1) a growth analysis, 2) a soil and vegetation analysis, and 3) a visibility analysis. PSD applications also require Class I area reviews to determine if any long-range modeling must be conducted. Each of these requirements are addressed below.

9.1 Growth Analysis

The purpose of the growth analysis is to quantify project associated growth; that is, to predict how much new growth is likely to occur in order to support the source or modification under review, and then to estimate the air quality impacts from this growth. The proposed project is a retroactive PSD at an existing facility. The modified facility will not require a significant increase in workforce and thus no significant population growth is expected as a result. Given the lack of population growth, there will not be any appreciable expansion in infrastructure associated with the project either. The increase in pollutant emissions associated with the new facility and their potential impact on the environment was addressed in analyses discussed elsewhere in this report.

9.2 Soils and Vegetation Analysis

The EPA developed the secondary NAAQS to protect certain air quality related values (i.e., soil and vegetation) that may not be sufficiently protected by the primary NAAQS. The project only triggers PSD for VOC and GHG emissions and there are no quantitative modeling standards associated with those. However, VOCs are regulated ozone precursors and there are NAAQS standards associated with ozone. Mobile County, AL, where the Bucks facility is located, is in attainment with respect to ozone³⁷ and as described in Appendix F, the proposed project would have an insignificant impact on new ozone formation. As such, the project would not be expected to have any harmful effects on the soils and vegetation in the area.

9.3 Visibility Analysis

The proposed project does not trigger PSD review for any visibility-affecting pollutants and as such, the proposed project will not have any visibility impact on airports, state forests and parks, scenic vistas, areas of special historic interest, or any other sensitive areas.

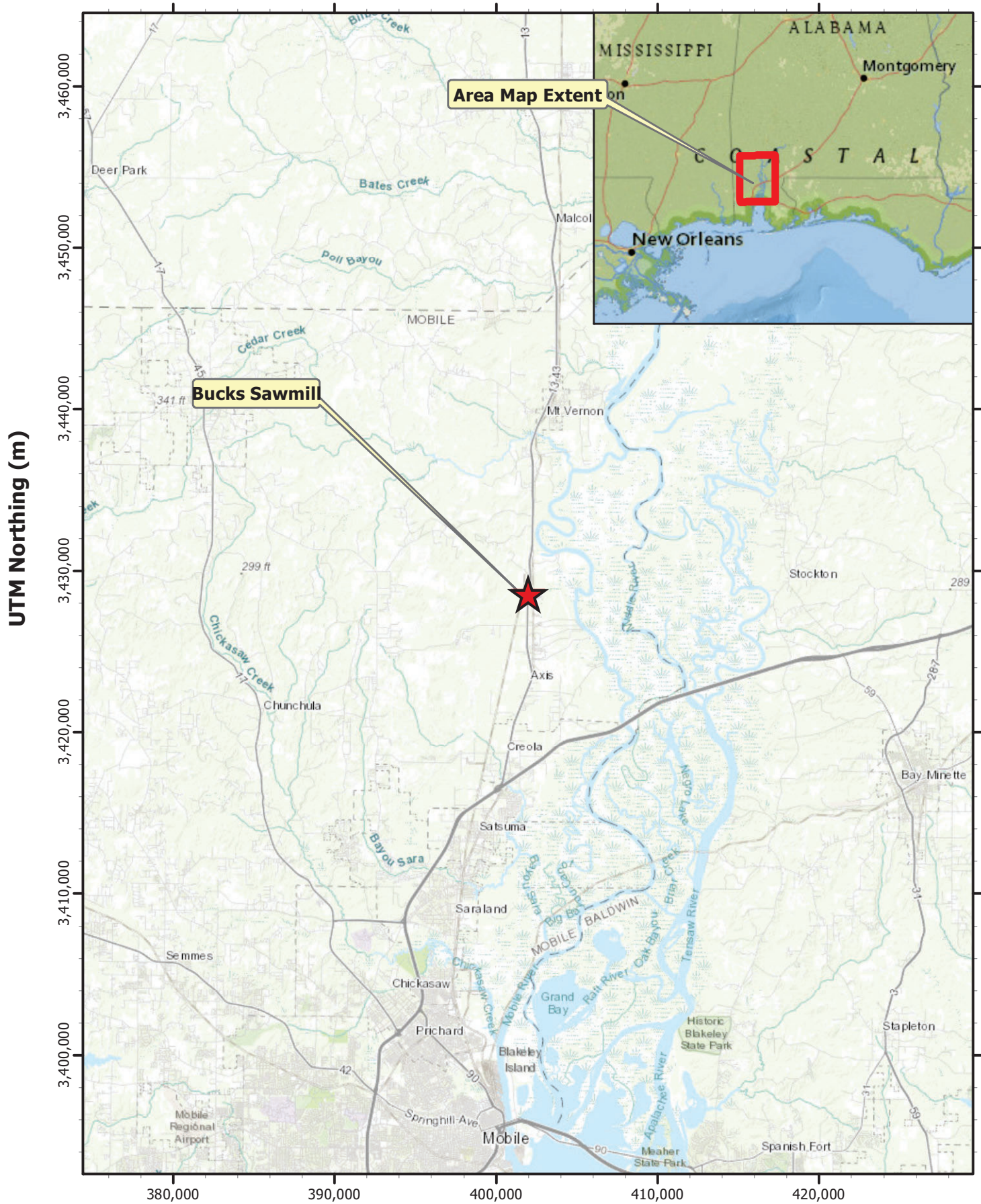
9.4 Class I Requirements

The proposed project does not trigger PSD review for any visibility-affecting pollutants or pollutants that contribute to acidic deposition, and as such no Class I Air Quality Related Values (AQRV) analyses are required for this project. Since there are no AQRV considerations, an FLM notification letter is not required either. In addition to AQRV review, PSD applications also just review Class I increment at any Class I areas within 100 km. The closest Class I area is Breton Wilderness Area and it is 145 km to the SW. Further the proposed project does not trigger PSD review for any increment-affecting pollutants. Therefore, no Class I increment evaluation is required for this project.

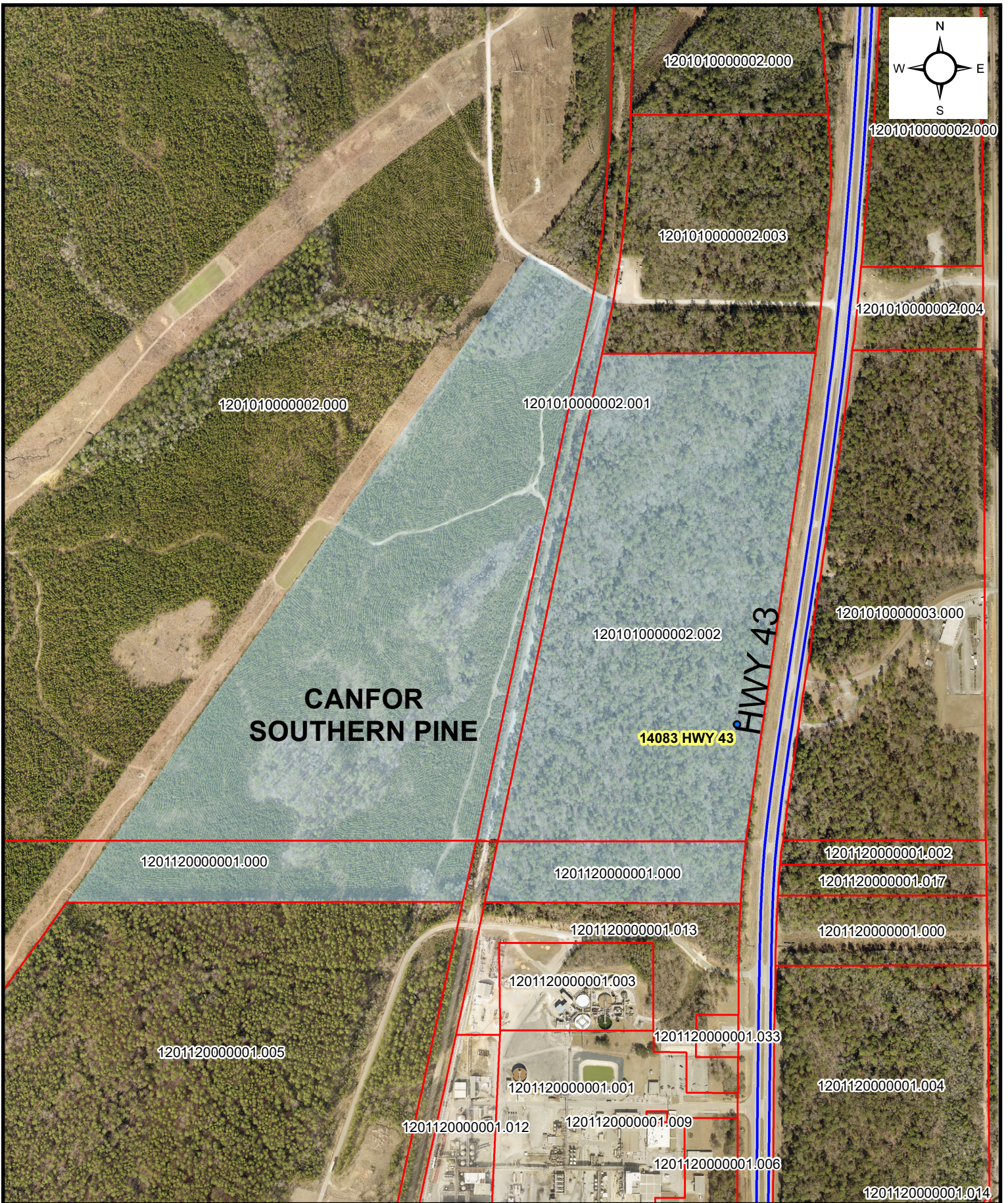
³⁷ https://www3.epa.gov/airquality/urbanair/sipstatus/reports/al_areabypoll.html#ozone-8hr__2008_

APPENDIX A. SITE MAP AND PROCESS DIAGRAMS

Figure A-1. Area Map
New South Lumber - Bucks, Mobile County, Alabama



UTM Easting (m)
All Coordinates shown in UTM Coordinates,
Zone 16, NAD 83 Datum



MOBILE COUNTY COMMISSION
 MOBILE GOVERNMENT PLAZA
 205 GOVERNMENT ST
 MOBILE, AL 36644-1600
 PHONE (251) 574-8097
 WWW.MOBILECOUNTYAL.GOV

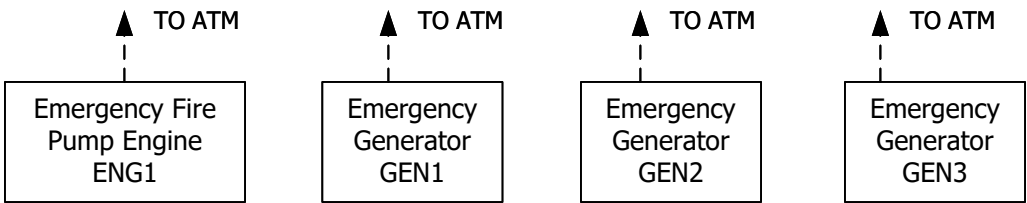
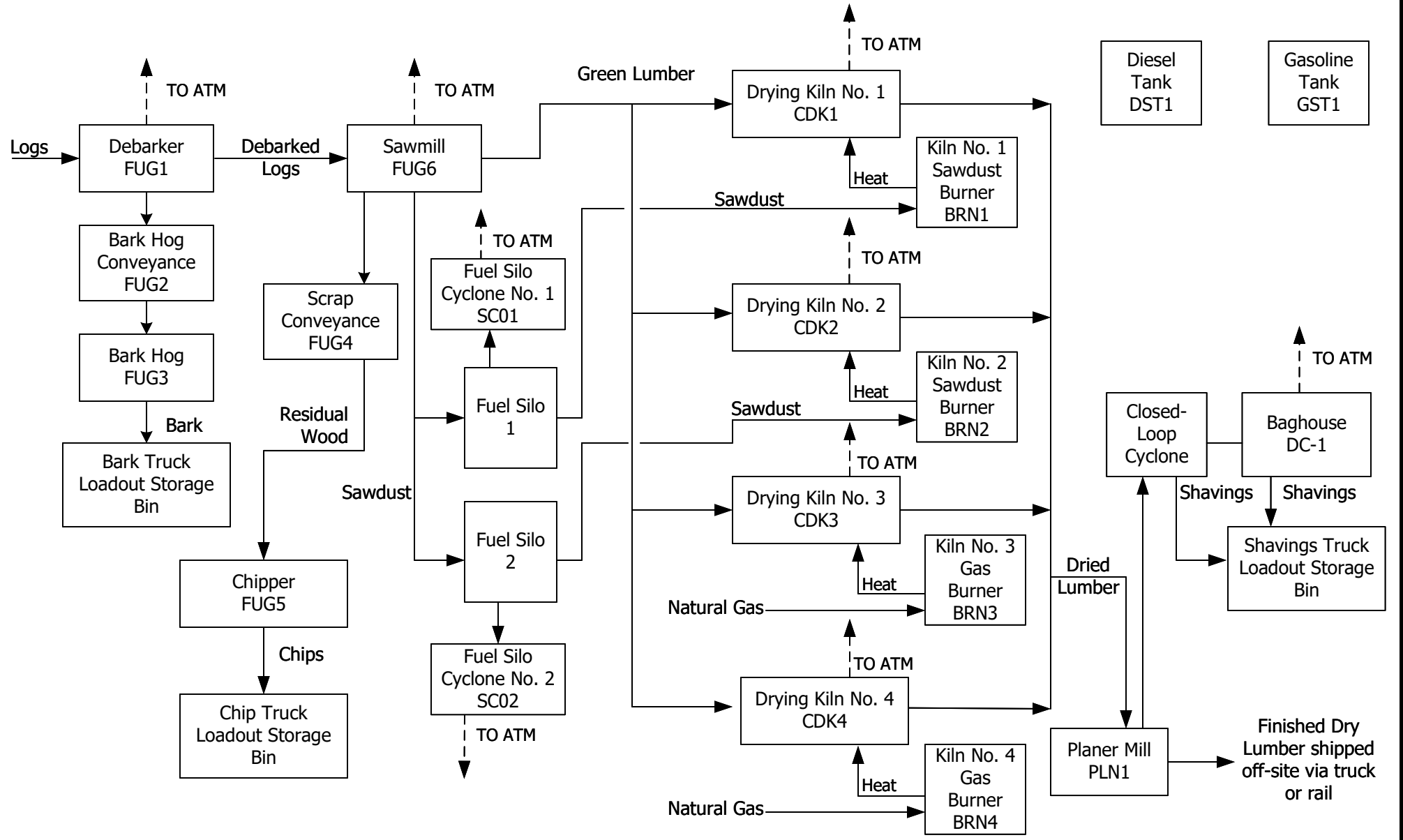
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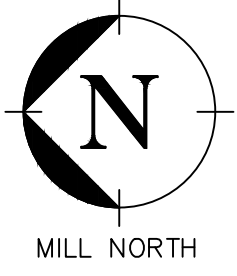
14083 HWY 43



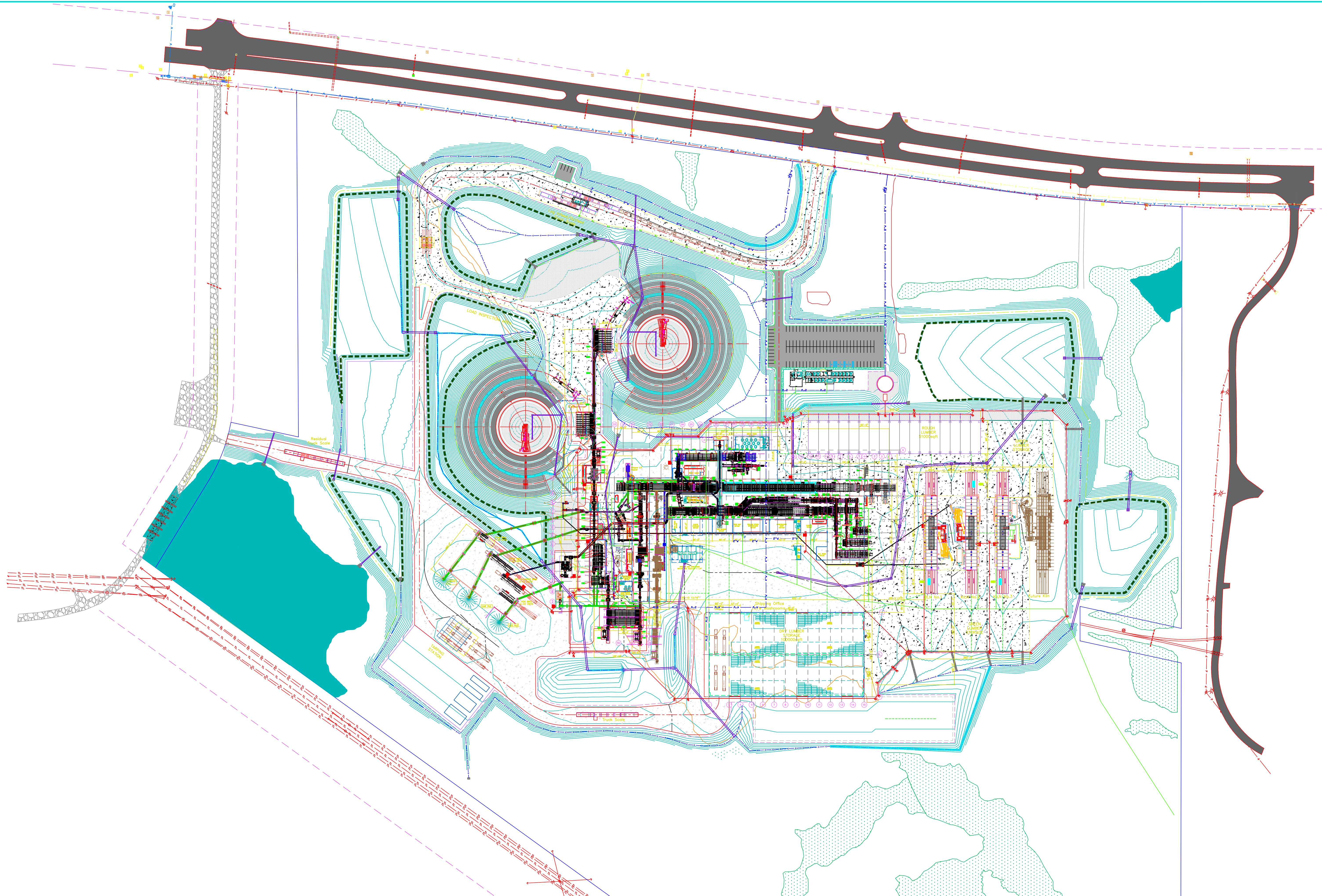
1 inch = 600 feet



New South Lumber Company Bucks, Alabama	
LEGEND EMISSIONS MATERIAL	Figure A-2 Process Flow Diagram
230101.0043 January 2026	



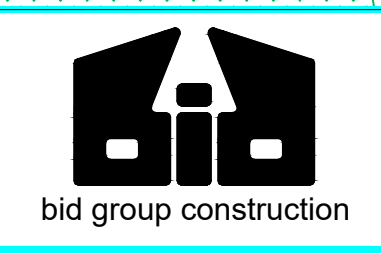
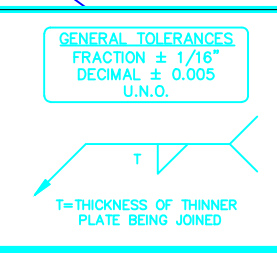
MILL NORTH



REV	DATE	BY	CHKD	REVISION DESCRIPTION
07	OCT 17/23	JGL		UPDATED BLDG/CIVIL/EQUIPMENT/ROADWAYS - ISSUED FOR INFO.
06	JUL 17/23	JGL		REVISED LOC. KILN/FINISHED SHED/TARP - ISSUED FOR CLIENT APPROVAL
05	JUN 29/23	JGL		UPDATED CIVIL PLAN - ISSUED FOR INFO.
04	JUN 16/23	JGL		UPDATED CIVIL PLAN & RESIDUALS & BUILDNGS - ISSUED FOR INFO.

REV	DATE	BY	CHKD	REVISION DESCRIPTION
03	MAY 05/23	JGL		CIVIL GRADE SITE UPDATE - ISSUED FOR INFORMATION
02	APR 25/23	JGL		REV. FINISHED LUMBER SHED AND KILN LOCATION - ISSUED FOR INFO.
01	APR 20/23	JGL		ISSUED FOR INFORMATION.

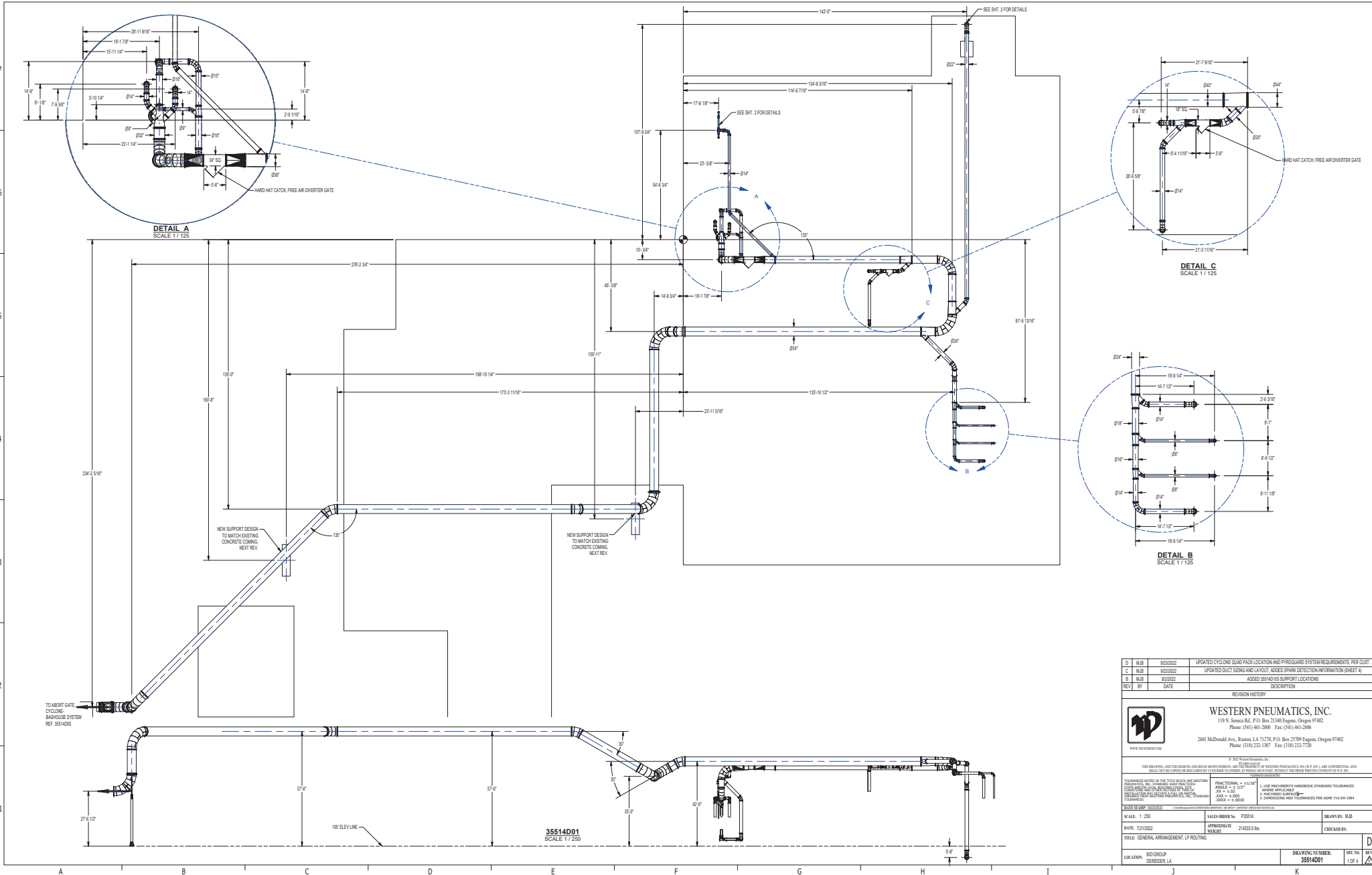
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CANFOR FOREST PRODUCTS
 AXIS ALABAMA
 SAWMILL AND PLANERMILL COMPLEX
 OVERALL SITE
 GENERAL ARRANGEMENT

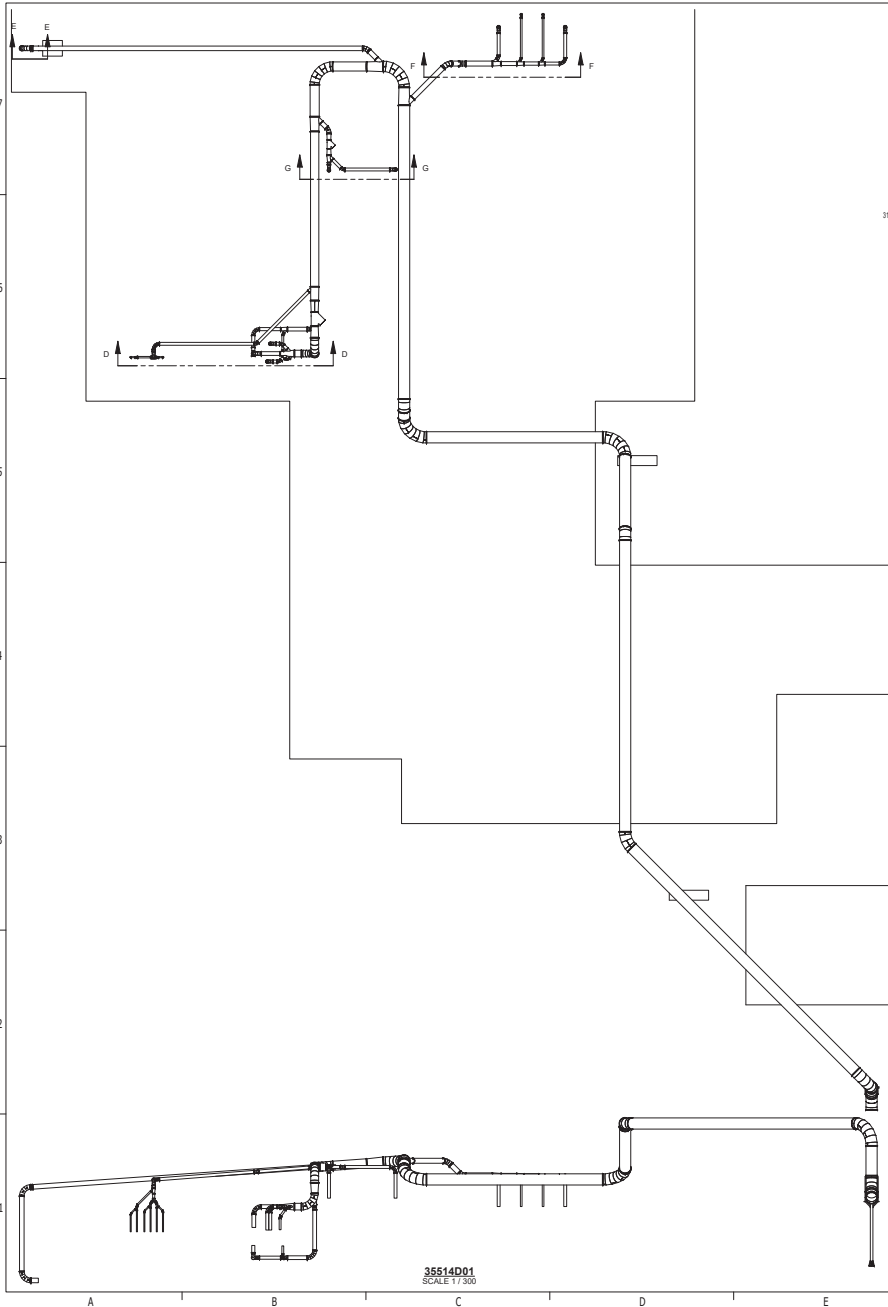
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DATE: APR 12/23	CHKD:
DRAWING NO. 01-101-01	REV. 07



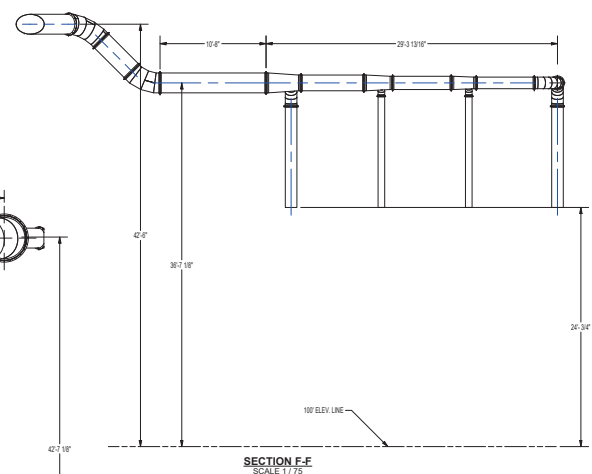
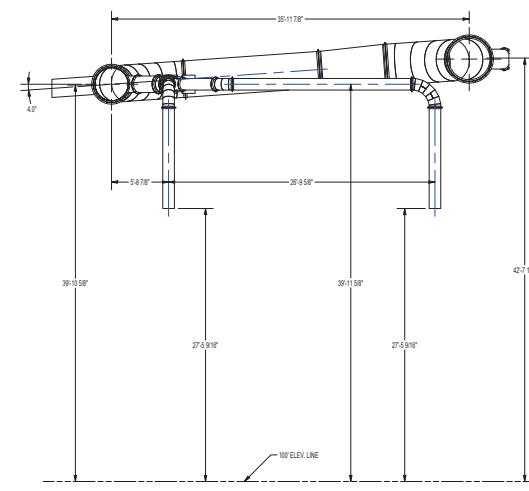
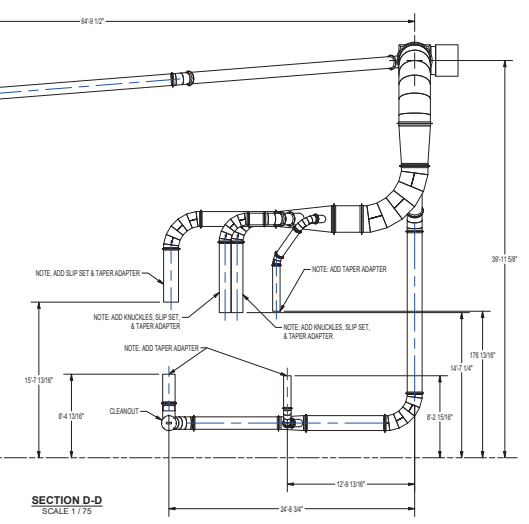
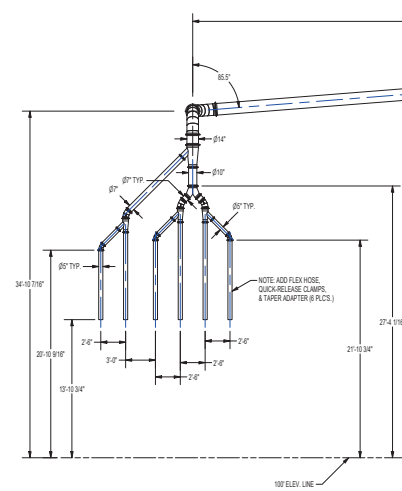
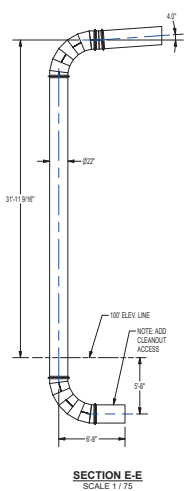
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D	MJB	8/23/2022	UPDATED CYCLONE QUAD PACK LOCATION AND PYROGARD SYSTEM REQUIREMENTS PER QEST
C	MJB	8/22/2022	UPDATED DUCT SIZING AND LAYOUT, ADDED SPARK DETECTION INFORMATION (SHEET 4)
B	MJB	8/22/2022	ADDED SSS4HDHS SUPPORT LOCATIONS
A			

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<small>TITLE: GENERAL ARRANGEMENT, LP ROUTING</small>			
<small>LOCATION: 810 GROUP</small> <small>ORDER: LA</small>	<small>DRAWING NUMBER: 35514001</small>	<small>SHEET NO. 1 OF 4</small>	<small>REV. 1</small>

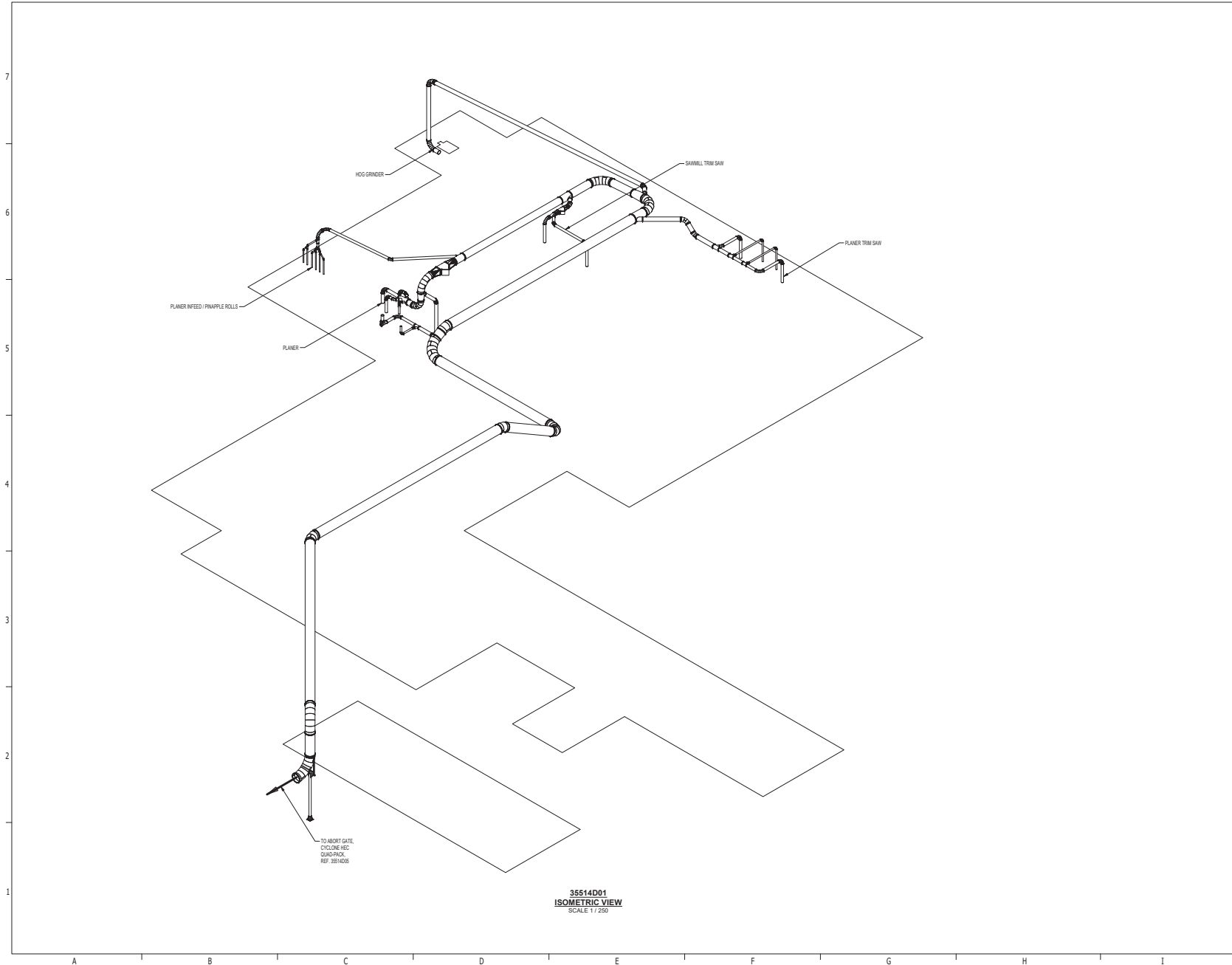


35514D01
SCALE 1/300



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<p>DATE: 7/2/2002</p>			
SCALE: AS NOTED	SALER NUMBER: P35514	DRAWN BY: MJE	
DATE: 7/2/2002	APPROPRIATE: WEST	CHECKED BY:	
TITLE: GENERAL ARRANGEMENT, LP ROUTING			
<p>LOCATION: BID GROUP ORDER: LA</p>		<p>DRAWING NUMBER: 35514D01</p>	
		<p>SHEET NO. 2 OF 4</p>	

**PRELIMINARY
NOT FOR CONST**



PLANER FEED PINWHEEL ROLLS
PLANER


HOG GRINDER

SHIMMILL TRIM SAW

PLANER TRIM SAW

TO ABORT GATE,
CYCLONE HOG
QUADPACK,
REF. 35514D05

35514D01
ISOMETRIC VIEW
SCALE 1/250

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						TOLERANCES UNLESS OTHERWISE SPECIFIED: DIMENSIONS IN INCHES: FRACTIONS TO 1/32" DECIMALS TO 0.0005" DIMENSIONS IN MILLIMETERS: DECIMALS TO 0.025mm UNLESS OTHERWISE SPECIFIED: FINISHES: 1. USE WESTERN'S HANDBOOK STANDARD TOLERANCES 2. MACHINED SURFACES PER ASME Y14.3M-1994 3. UNMACHINED SURFACES PER ASME Y14.3M-1994		
TOLERANCES UNLESS OTHERWISE SPECIFIED: DIMENSIONS IN INCHES: FRACTIONS TO 1/32" DECIMALS TO 0.0005" DIMENSIONS IN MILLIMETERS: DECIMALS TO 0.025mm UNLESS OTHERWISE SPECIFIED: FINISHES: 1. USE WESTERN'S HANDBOOK STANDARD TOLERANCES 2. MACHINED SURFACES PER ASME Y14.3M-1994 3. UNMACHINED SURFACES PER ASME Y14.3M-1994			DATE: 07/20/02 SCALE: AS NOTED DATE: 7/2/2002 TITLE: GENERAL ARRANGEMENT, LP ROUTING			SALES ORDER No: P35514 APPROXIMATE WEIGHT: 214333.5 lbs. DRAWN BY: MJE CHECKED BY:		
BID GROUP: DERDOR LA			DRAWING NUMBER: 35514D01			SHEET NO: 3 OF 4		

SPARK DETECTION SYSTEM DETAILS:

CONSOLE BRAND: CLARKE'S PYROGUARD

DETECT ZONE #1: PLANNER
 PIPE DIAMETER AT LOC: 39"-Ø
 APPROX. PIPE FLOW AT LOC: 4365 CFM
 APPROX. VELOCITY AT LOC: 5600 FPM

DETECT ZONE #2: MAIN TRUNKLINE
 PIPE DIAMETER AT LOC: 34"-Ø
 EXPECTED PIPE FLOW AT LOC: 18180 CFM
 EXPECTED VELOCITY AT LOC: 5170 FPM

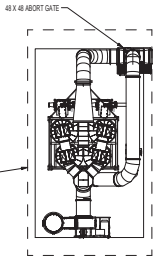
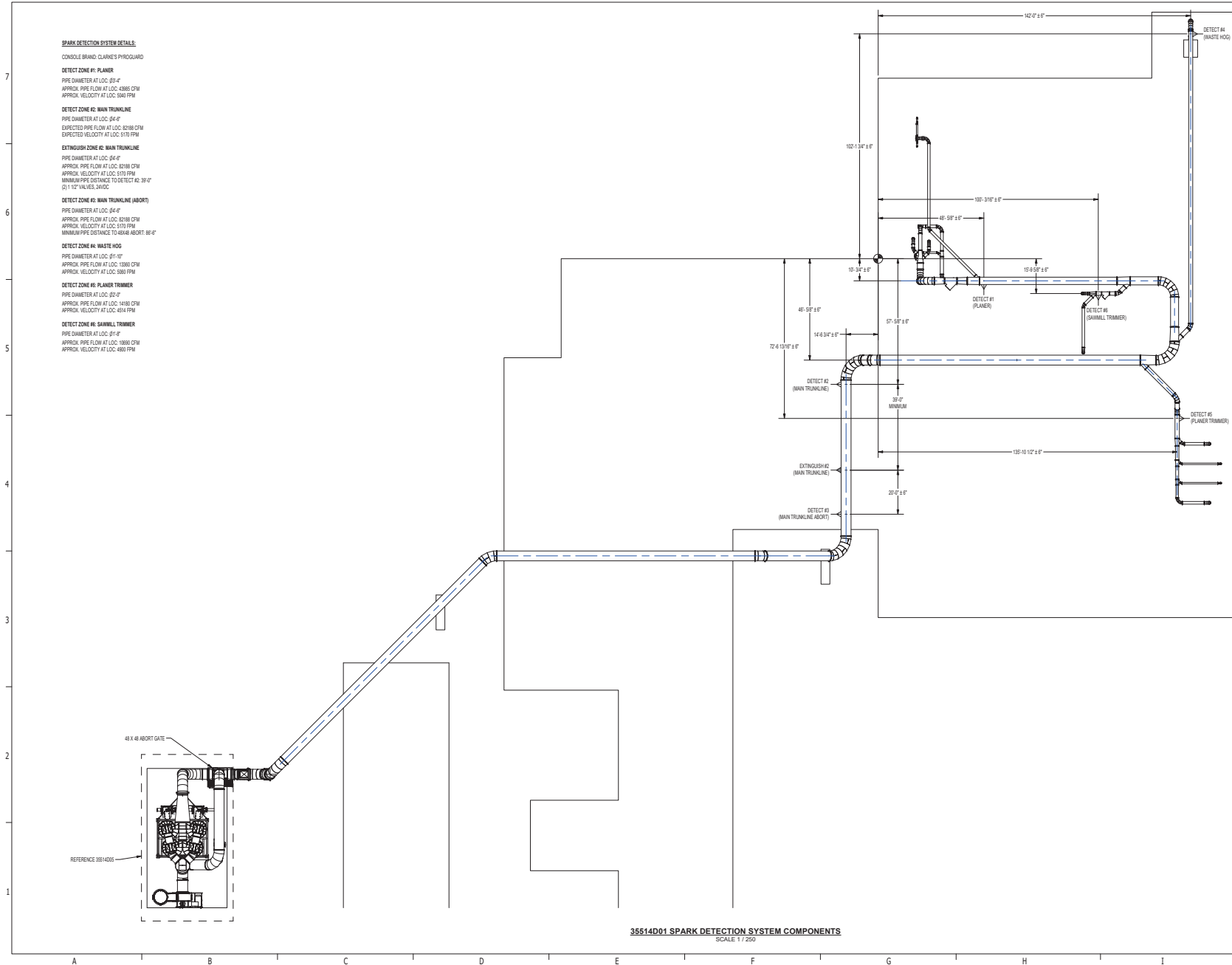
EXTINGUISH ZONE #2: MAIN TRUNKLINE
 PIPE DIAMETER AT LOC: 34"-Ø
 APPROX. PIPE FLOW AT LOC: 82180 CFM
 APPROX. VELOCITY AT LOC: 5170 FPM
 MINIMUM PIPE DISTANCE TO DETECT #2: 39'-0"
 (2) 1"Ø VALVES 2400C

DETECT ZONE #3: MAIN TRUNKLINE (ABORT)
 PIPE DIAMETER AT LOC: 34"-Ø
 APPROX. PIPE FLOW AT LOC: 82180 CFM
 APPROX. VELOCITY AT LOC: 5170 FPM
 MINIMUM PIPE DISTANCE TO ABORT: 86'-0"


DETECT ZONE #4: WASTE HOOD
 PIPE DIAMETER AT LOC: 31'-Ø
 APPROX. PIPE FLOW AT LOC: 13300 CFM
 APPROX. VELOCITY AT LOC: 5000 FPM

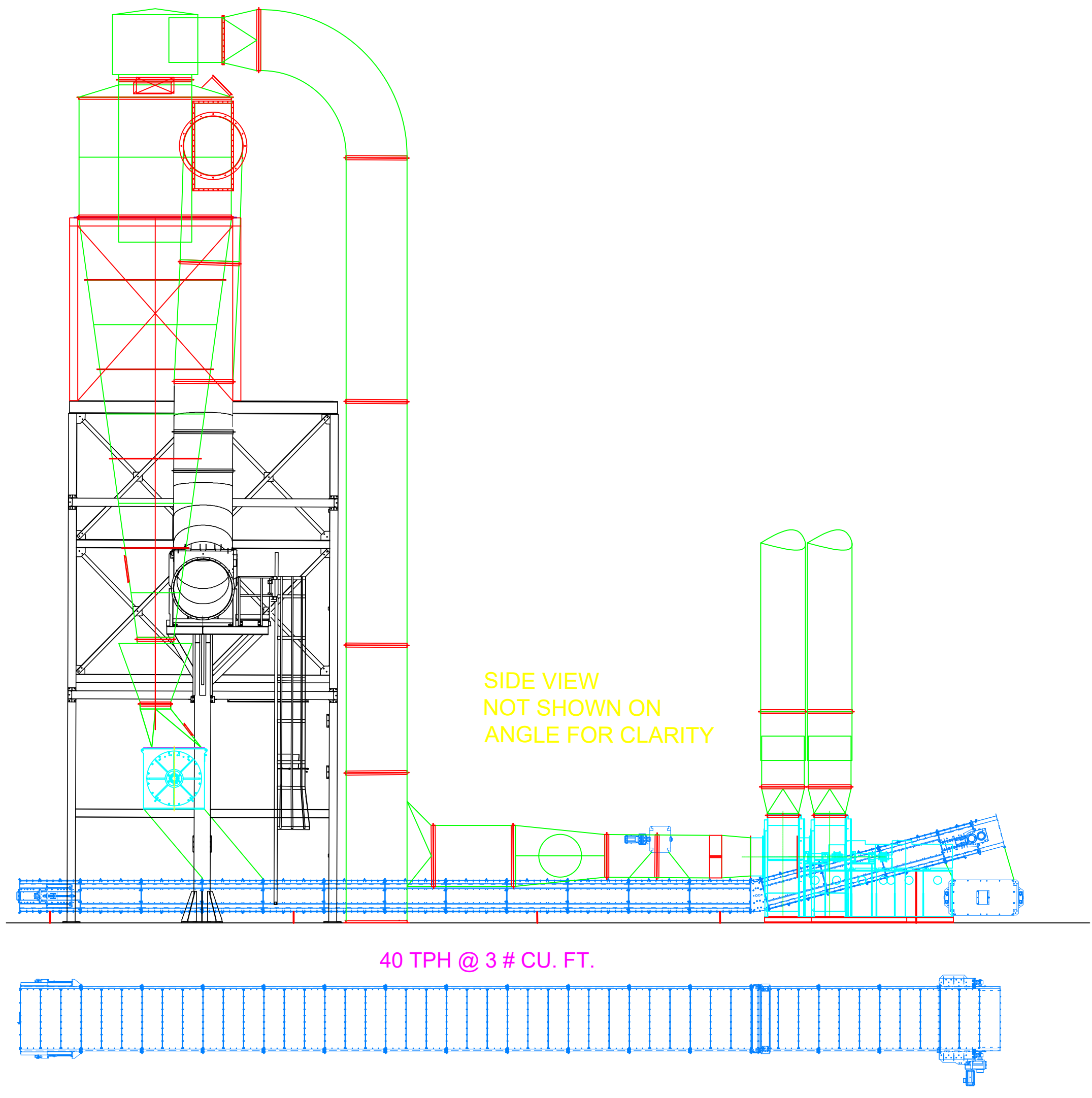
DETECT ZONE #5: PLANNER TRIMMER
 PIPE DIAMETER AT LOC: 25'-Ø
 APPROX. PIPE FLOW AT LOC: 14180 CFM
 APPROX. VELOCITY AT LOC: 4514 FPM

DETECT ZONE #6: SAWMILL TRIMMER
 PIPE DIAMETER AT LOC: 31'-Ø
 APPROX. PIPE FLOW AT LOC: 18000 CFM
 APPROX. VELOCITY AT LOC: 4600 FPM



35514D01 SPARK DETECTION SYSTEM COMPONENTS
 SCALE 1/2"=1'-0"

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DATE: 7/1/2002	SALES ORDER No.: P35514	APPROVALS:	DRAWN BY: MJE
SCALE: AS NOTED	WEIGHT: 214333.5 Lbs.	CHECKED BY:	D
TITLE: GENERAL ARRANGEMENT, LP ROUTING			DRAWING NUMBER: 35514D01
DIVISION: BID GROUP DERORDER LA		SHEET NO.: 4 OF 4	REV:



ASM NEW STYLE DESIGN 168 CYCLONE W/ VENTS,
PAINTED, C.O.D., 110V BINDICATOR AND NEW
SUPPORT STEEL ON TOP OF EXISTING

2) NEW PHELPS WRM 640 FANS PAINTED
W/ DIRECT-DRIVE & VFD READY 400 HP MOTORS
EACH W/ 2) 110V ZERO MOTION SENSORS

NEW CLARKE'S CFV-48 FEEDER
W/ 20 HP MOTOR & 110V
ZERO MOTION SENSOR

2) SETS OF
DETECTION
EYES

99,090 CFM @ 26" STATIC

NEW BIO-MASS 60M CONVEYOR PAINTED
W/ DELUGE, SUPPORTS & 30 HP MOTOR

NEW PIPE SUPPORTS FOR
RETURN PIPE TO FILTER

NEW BIO-MASS 60M CONVEYOR PAINTED
W/ DELUGE, SUPPORTS & 15 HP MOTOR

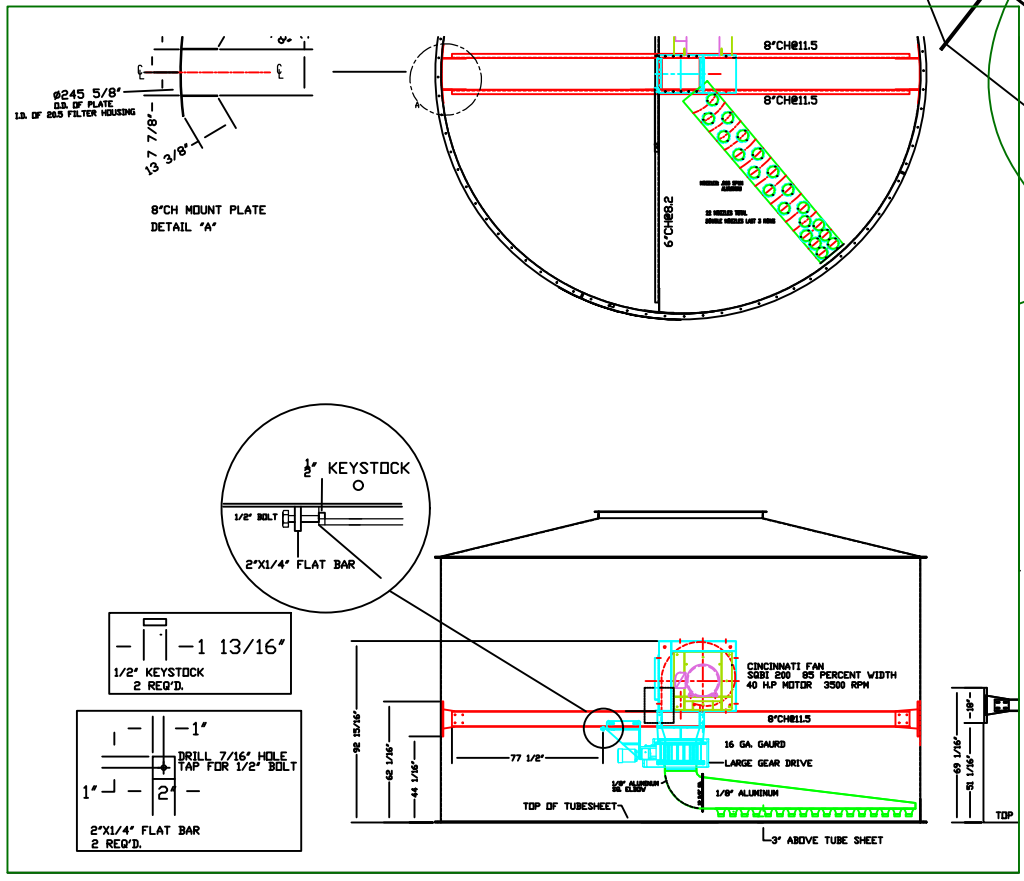
NEW BIO-MASS 18S CONVEYOR
PAINTED W/ DELUGE,
SUPPORTS &
3 HP MOTOR

CLARKE'S NEW CP-55
HI-SPEED ABORT VALVE
W/ NEW SUPPORT STEEL
& 110V LIMIT SWITCH &
DUFT-NORTON ACTUATOR

CLARKE'S NEW 60" ISOLATION
DAMPER W/ NEW SUPPORT STEEL
& 110V LIMIT SWITCH

CUSTOMERS EXISTING MAC FILTER
W/ NEW REVERSE AIR CLEANING HEAD &
MANIFOLD (2 HP MOTOR) AND 40 HP MOTOR
FAN W/ NEW GRID PLATE, CAGES & BAGS,
PAINTED AND 110V BINDICATOR IN CONE

CLARKE'S NEW 25 X 30 FEEDER
W/ 5 HP MOTOR & 110V
ZERO MOTION SENSOR

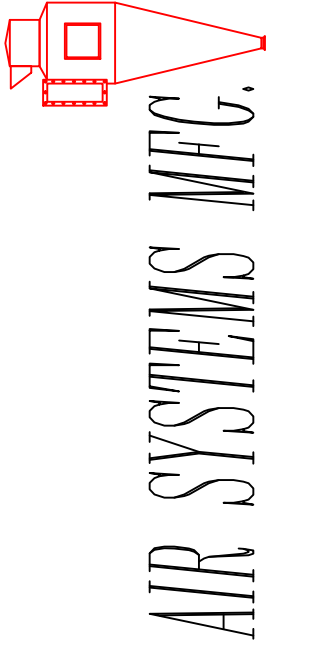


SIDE VIEW
NOT SHOWN ON
ANGLE FOR CLARITY

40 TPH @ 3# CU. FT.

1 TPH @ 5# CU. FT.

NEW PLATFORM STEEL
FOR CONVEYOR ACCESS



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NO.	DATE	REVISION DESCRIPTION	BY	CHKD

NO.	DATE	REVISION DESCRIPTION	BY	CHKD

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APPENDIX B. DETAILED EMISSIONS CALCULATIONS

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-1. Potential Facility-Wide Emissions Summary (tpy)

EUID No	Emission Unit Description	APCD ID No	Control Device Description	Filterable										Max Individual	
				PM	Total PM ₁₀	Total PM _{2.5}	NO _x	CO	VOC	SO ₂	Lead	CO ₂ e ¹	Total HAP ²	HAP ³	
<i>Point Emissions Sources</i>															
CDK1	Continuous Kiln No. 1 ⁴	N/A	None	2.637	3.862	3.676	10.26	16.14	175.77	3.52	6.76E-03	29,492	12.25	6.66	
CDK2	Continuous Kiln No. 2 ⁴	N/A	None	2.637	3.862	3.676	10.26	16.14	175.77	3.52	6.76E-03	29,492	12.25	6.66	
CDK3	Continuous Kiln No. 3 ⁴	N/A	None	0.520	0.960	0.946	7.73	12.99	190.90	0.09	7.73E-05	18,464	11.49	6.44	
CDK4	Continuous Kiln No. 4 ⁴	N/A	None	0.520	0.960	0.946	7.73	12.99	190.90	0.09	7.73E-05	18,464	11.49	6.44	
PLN1	Planer Mill	DC-1	Dust System	0.558	0.558	0.558	--	--	--	--	--	--	--	--	
ENG1	Emergency Fire Water Pump	N/A	None	5.02E-03	3.36E-02	3.36E-02	0.10	0.09	3.77E-02	1.66E-04	--	17.6	4.14E-04	--	
GEN1	Emergency Generator Engine No. 1	N/A	None	1.46E-06	1.46E-06	1.46E-06	5.95E-02	2.30	0.32	1.11E-05	--	2.08	2.29E-07	2.55E-09	
GEN2	Emergency Generator Engine No. 2	N/A	None	1.46E-06	1.46E-06	1.46E-06	5.95E-02	2.30	0.32	1.11E-05	--	2.08	2.29E-07	2.55E-09	
GEN3	Emergency Generator Engine No. 3	N/A	None	1.86E-06	1.86E-06	1.86E-06	7.60E-02	2.94	0.41	1.42E-05	--	2.66	3.74E-07	4.17E-09	
SC01	Fuel Silo Cyclone No. 1	N/A	Cyclone	4.38	0.60	0.061	--	--	--	--	--	--	--	--	
SC02	Fuel Silo Cyclone No. 2	N/A	Cyclone	4.38	0.60	0.061	--	--	--	--	--	--	--	--	
DST1	Diesel Storage Tank	N/A	None	--	--	--	--	--	1.67E-04	--	--	--	--	--	
GST1	Gasoline Storage Tank	N/A	None	--	--	--	--	--	4.06E-02	--	--	--	--	--	
<i>Fugitive Emissions Sources</i>															
CDK1	Continuous Kiln No. 1	N/A	None	0.66	0.96	0.92	2.55	4.01	43.94	0.88	1.68E-03	7,335	3.06	1.67	
CDK2	Continuous Kiln No. 2	N/A	None	0.66	0.96	0.92	2.55	4.01	43.94	0.88	1.68E-03	7,335	3.06	1.67	
CDK3	Continuous Kiln No. 3	N/A	None	0.13	0.24	0.24	1.93	3.25	47.73	2.32E-02	1.93E-05	4,616	2.87	1.61	
CDK4	Continuous Kiln No. 4	N/A	None	0.13	0.24	0.24	1.93	3.25	47.73	2.32E-02	1.93E-05	4,616	2.87	1.61	
FUG1	Log Debarking	N/A	None	6.03	3.01	1.51	--	--	--	--	--	--	--	--	
FUG2	Mechanical Conveyance of Bark to Bark Hog	N/A	None	4.62E-03	2.19E-03	3.31E-04	--	--	--	--	--	--	--	--	
FUG3	Bark Hogging	N/A	None	0.20	0.10	5.02E-02	--	--	--	--	--	--	--	--	
FUG4	Mechanical Conveyance of Scraps to Chipper	N/A	None	1.25E-02	5.90E-03	8.94E-04	--	--	--	--	--	--	--	--	
FUG5	Log Chipping	N/A	None	1.63	0.81	0.41	--	--	--	--	--	--	--	--	
FUG6	Sawing	N/A	None	29.31	14.65	7.33	--	--	--	--	--	--	--	--	
FT01	Road Travel	N/A	None	0.31	6.19E-02	1.52E-02	--	--	--	--	--	--	--	--	
Facility-Wide Emissions from Point Sources (tpy):				15.63	11.44	9.96	36.28	65.89	734.46	7.23	1.37E-02	119,839	47.5	26.2	
Title V Major Source Threshold (tpy):				100	100	100	100	100	100	100	10	100,000	25	10	
Title V Major Source? (Yes/No):				No	No	No	No	No	Yes	No	No	Yes	Yes	Yes	
PSD Major Source Threshold (tpy):				250	250	250	250	250	250	250	250	100,000	N/A	N/A	
PSD Major Source? (Yes/No):				No	No	No	No	No	Yes	No	No	Yes	No	No	
PSD Significant Emission Rate (tpy):				25	15	10	40	100	40	40	0.6	75,000	N/A	N/A	
PSD Permitting Triggered? (Yes/No):				No	No	No	No	No	Yes	No	No	Yes	No	No	

- CO₂e emissions include fugitive emissions from kilns.
- Total HAP from CDK1, CDK2, CDK3, and CDK4 are accounted for under each burner.
- The maximum individual HAP is methanol.
- Summary emissions account for downtime processes for continuous kilns.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-2. Wood-Fired Kiln Information

Kiln ID	Heat Input Capacity (MMBtu/hr)	Fuel HHV ¹ (Btu/lb)	Potential Hours of Normal Operation (hr/yr)	Production Capacity		Estimated Hours for Startup (hr/yr)	Maximum Possible Startup Fuel Usage per Startup		Estimated Startups (#/yr)
				(MBF/hr)	(MBF/yr)		Gallons	Tons	
CDK1	40	4,500	8,760	10.6	92,500	48	3	48	4
CDK2	40	4,500	8,760	10.6	92,500	48	3	48	4

- The average heating value for green sawdust is 9,000,000 Btu/ton (4,500 Btu/lb), per University of Connecticut, Approximate Heating Value of Common Fuels. <https://ipm.cahnr.uconn.edu/heating-value-fuels/>
- Estimated hours required per calendar quarter to conduct startup functions of each kiln. All emissions during these times would be routed through the burner abort stack.
12 hours per quarter
- During startup, diesel fuel will be utilized. The expected diesel fuel usage is 12 gallons / year / kiln.
Wood fuel used during startup is expected at 48 tons per startup. Total of 192 tons of wood / year / kiln (maximum rated consumption).

Table B-3a. Potential Emissions from Direct-Fired Continuous Kiln (Normal Operations)

Pollutant	Emission Factors	Units	CDK1 Potential Emissions		CDK2 Potential Emissions		Total Emissions ⁹		Point Source Emissions ⁹	
			(lb/hr) ¹	(tpy) ¹	(lb/hr) ¹	(tpy) ¹	(lb/hr) ¹	(tpy) ¹	(lb/hr) ¹	(tpy) ¹
<i>Criteria</i>										
NO _x ²	0.276	lb/MBF	2.91	12.77	2.91	12.77	5.83	25.53	4.66	20.42
VOC ³	4.75	lb/MBF	50.16	219.7	50.16	219.7	100.31	439.4	80.25	351.50
CO ²	0.43	lb/MBF	4.58	20.07	4.58	20.07	9.17	40.15	7.33	32.12
Total PM ²⁻⁴	0.140	lb/MBF	1.48	6.48	1.48	6.48	2.96	12.95	2.37	10.36
Filterable PM	0.071	lb/MBF	0.75	3.28	0.75	3.28	1.50	6.57	1.20	5.25
Total PM ₁₀ ^{2,4}	0.104	lb/MBF	1.10	4.81	1.10	4.81	2.20	9.62	1.76	7.70
Total PM _{2.5} ^{2,4}	0.099	lb/MBF	1.05	4.58	1.05	4.58	2.09	9.16	1.67	7.32
Condensable PM ⁸	0.069	lb/MBF	0.73	3.19	0.73	3.19	1.46	6.38	1.17	5.11
SO ₂ ⁵	0.025	lb/MMBtu	1.00	4.38	1.00	4.38	2.00	8.76	1.60	7.01
Lead ⁶	4.80E-05	lb/MMBtu	1.92E-03	8.41E-03	1.92E-03	8.41E-03	3.84E-03	1.68E-02	3.07E-03	0.01
<i>Greenhouse Gas⁷</i>										
CO ₂	207	lb/MMBtu	8,272	36,230	8,272	36,230	16,543	72,460	13,235	57,968
CH ₄	1.6E-02	lb/MMBtu	0.63	2.78	0.63	2.78	1.27	5.56	1.02	4.45
N ₂ O	7.9E-03	lb/MMBtu	0.32	1.39	0.32	1.39	0.63	2.78	0.51	2.22
Total CO ₂ e			8,374	36,677	8,374	36,677	16,747	73,353	13,398	58,683

- Potential annual emissions were calculated using the following equations based on the units of the emission factor:
 $Potential\ emissions\ [tpy] = Emission\ factor\ [lb/MBF] \times Annual\ production\ capacity\ [MMBF/yr] \times 1,000 / 2,000\ [lb/ton]$
 $Potential\ emissions\ [tpy] = Emission\ factor\ [lb/MMBtu] \times Heat\ input\ capacity\ [MMBtu/hr] \times Annual\ hours\ of\ operation\ [hr/yr] / 2,000\ [lb/ton]$
- Emission factor referenced in Major Source Operating Permit renewal in April 2020 for Scotch Gulf Lumber, LLC in Fulton, AL
- VOC is converted from VOC as C to WPP1 VOC as follows:
 $VOC\ (WPP1) = [(VOC\ as\ C) \times 1.225] + (1 - 0.65) \times Methanol + Formaldehyde$
 $VOC\ (WPP1) = (3.8 \times 1.225) + (1 - 0.65) \times 0.16 + 0.04$
 Wood Products Protocol 1 VOC from the EPA document, "Interim VOC Measurement Protocol for the Wood Products Industry – July 2007."
- Total PM₁₀/PM_{2.5} emissions are the sum of filterable and condensable particulate.
- AP-42 Section 1.6 Wood Residue Combustion in Boilers, Table 1.6-2 Emission Factors (04/2022)
- AP-42 Section 1.6 Wood Residue Combustion in Boilers, Table 1.6-4 Emission Factors (04/2022)
- Emission factors for CO₂, CH₄, and N₂O from 40 CFR Part 98, Subpart C, Tables C-1 and C-2. CO₂e emissions are calculated based on a global warming potential of 1 for CO₂, 28 for CH₄, and 265 for N₂O, based on 40 CFR 98, Subpart A.
- Condensable PM value from EPD Recommended Emission factors for Lumber Kiln Permitting in Georgia.
- Point Source Emission are based on PSD Modeling guidance from ADEM. Point source emissions from the kilns are equal to 80% of the total emissions. Fugitive kiln emissions account for 20% of the total emissions.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-3b. Potential Emissions from Direct-Fired Continuous Kiln (Startup Operations)

Pollutant	Emission Factors		CDK1 Potential Emissions		CDK2 Potential Emissions		Total Emissions ¹¹	
	Diesel Fuel ¹	Wood ^{2,3}	(lb/yr) ¹⁰	(tpy) ¹⁰	(lb/yr) ¹⁰	(tpy) ¹⁰	(lb/yr)	(tpy)
Criteria	lb/1000 gal	lb/hr						
NO _x	20.0	2.19	105.16	0.053	105.16	0.053	210.32	0.11
VOC ³	0.20	0.68	32.64	0.016	32.64	0.016	65.28	0.032
CO	5.00	3.44	165.04	0.083	165.04	0.083	330.08	0.17
Total PM ^{4,5}	3.30	0.88	42.11	0.021	42.11	0.021	84.22	0.042
Filterable PM	2.00	0.43	20.42	0.010	20.42	0.010	40.85	0.020
Total PM ₁₀ ^{4,5}	2.30	0.59	28.41	0.014	28.41	0.014	56.82	0.028
Total PM _{2.5} ^{4,5}	1.54	0.55	26.50	0.013	26.50	0.013	53.00	0.026
Condensable PM ⁴	1.30	0.45	21.68	0.011	21.68	0.011	43.37	0.02
Filterable PM	2.00	0.43	20.42	0.010	20.42	0.010	40.85	0.02
SO ₂ ⁶	0.213	0.75	36.00	0.02	36.00	0.02	72.0	0.04
Lead ⁷	8.30E-03	1.44E-03	0.07	3.46E-05	0.07	3.46E-05	0.14	6.92E-05
Greenhouse Gas⁸								
CO ₂	22,300	6,204	298,050	149.03	298,050	149.03	596,101	298.05
CH ₄	5.2E-02	0.48	22.86	0.01	22.86	0.01	45.72	0.02
N ₂ O	0.26	0.24	11.43	5.72E-03	11.43	5.72E-03	22.86	0.01
Total CO ₂ e ⁹	22,370.36	6,280	301,720	150.86	301,720	150.86	603,440	301.72

1. AP-42 Section 1.3 Fuel Oil Combustion, Table 1.3-1, Boilers < 100 MMBtu/hr, Distillate oil fired, SO₂, NO_x, CO, Filterable PM

AP-42 Section 1.3 Fuel Oil Combustion, Table 1.3-2, No. 2 oil fired, Condensable PM

AP-42 Section 1.3 Fuel Oil Combustion, Table 1.3-3, Total Organic Compounds (TOC) for Industrial boilers, Distillate oil fired

2. Wood emission factors based on lb/hr values in Table B-3. New South applied a reduction in these lb/hr emission factors as the factors above correspond to maximum or potential fuel firing rates. It is anticipated that during startup, fuel firing rates will be substantially lower than maximum firing rates that would be expected during normal operations.

Conservative % EF Reduction = 25%

3. VOC Emission factor (lb/MMBtu) from AP-42 Section 1.6 Wood Residue Combustion in Boilers, Table 1.6-3 Emission Factors (04/2022) to more accurately reflect abort stack operations. Converted from lb/MMBtu to lb/hr by multiplying the maximum firing rate of each kiln burner.

0.017 lb/MMBtu times 40 MMBtu/hr equals 0.68 lb/hr

4. Total PM/PM₁₀/PM_{2.5} emissions are the sum of filterable and condensable particulate. For PM species, the wood drying emission factor (presented in Table B-6) is subtracted from the hourly emission rate as wood drying is not occurring during startup and only emissions from fuel combustion are necessary.

Pollutant	Wood Drying EF	Hourly Emissions
Total PM	2.20E-02 lb/MBF	0.23 lb/hr
Total PM ₁₀	2.20E-02 lb/MBF	0.23 lb/hr
Total PM _{2.5}	2.20E-02 lb/MBF	0.23 lb/hr
Condensable PM	9.00E-03 lb/MBF	0.10 lb/hr

5. Filterable PM₁₀ and PM_{2.5} size fractions for Fuel Oil Combustion are applied based on AP-42 Section 1.3, Table 1.3-6 for uncontrolled industrial boilers firing distillate oil.

Filterable PM₁₀ Size Fraction = 50%
Filterable PM_{2.5} Size Fraction = 12%

6. SO₂ emissions are determined by 142S lb/1000 gallons, where S = weight % of sulfur in oil. New South will use diesel fuel certified to meet NSPS IIII standard of 15 ppmv.

Max. 15 ppmv = 0.0015 % sulfur by weight (max.)

7. South Coast Air Quality Management District, Combustion Default Emission Factors (Revised December 2024), Toxic Air Contaminant Emission Factors for External Combustion Equipment, Diesel / Distillate oil

8. AP-42 Section 1.3 Fuel Oil Combustion, Table 1.3-12, 1.3-8, & 1.3-3

9. CO₂e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2025. GWPs used for CO₂, CH₄, and N₂O are listed below. Emission factors for CO₂, CH₄, and N₂O from 40 CFR Part 98, Subpart C, Tables C-1 and C-2.

CO ₂	1
CH ₄	28
N ₂ O	265

10. Potential annual emissions were calculated using the following equations based on the units of the emission factor:

Potential emissions [lb/yr] = Diesel combustion emissions (Emission factor [lb/1000 gal] × Annual fuel usage [gal/yr]) + Wood Combustion emissions (Emission Factor [lb/hr] × Annual startup hours [hr/yr])

Potential emissions [tpy] = [lb/yr] / 2,000 [lb/ton]

11. Total emissions = CDK1 + CDK2 emissions

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-4a. Potential HAP/TAP Emissions from Direct-Fired Continuous Kiln

Pollutant	HAP	TAP	Emission Factor	Reference	CDK1 Potential Emissions		CDK2 Potential Emissions		Total Potential Emissions ¹¹		Point Source Emissions ¹¹	
					(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
<i>Volatile HAP/TAP</i>												
1,1,2-Trichloroethane	H	T	1.20E-04 lb/MMBtu	3	4.80E-03	0.02	4.80E-03	0.02	9.60E-03	0.04	7.68E-03	0.03
1,2,4-Trichlorobenzene	H	T	5.50E-05 lb/MMBtu	3	2.20E-03	9.64E-03	2.20E-03	9.64E-03	4.40E-03	0.02	3.52E-03	0.02
2,4,6-Trichlorophenol	H	T	2.40E-08 lb/MMBtu	3	9.60E-07	4.20E-06	9.60E-07	4.20E-06	1.92E-06	8.41E-06	1.54E-06	6.73E-06
2,4-Dinitrophenol	H	T	2.60E-07 lb/MMBtu	3	1.04E-05	4.56E-05	1.04E-05	4.56E-05	2.08E-05	9.11E-05	1.66E-05	7.29E-05
2,4-Dinitrotoluene	H	T	9.40E-07 lb/MMBtu	3	3.76E-05	1.65E-04	3.76E-05	1.65E-04	7.52E-05	3.29E-04	6.02E-05	2.64E-04
2-Nitrophenol			4.20E-08 lb/MMBtu	3, 7	1.68E-06	7.36E-06	1.68E-06	7.36E-06	3.36E-06	1.47E-05	2.69E-06	1.18E-05
4-Nitrophenol	H	T	1.20E-07 lb/MMBtu	3	4.80E-06	2.10E-05	4.80E-06	2.10E-05	9.60E-06	4.20E-05	7.68E-06	3.36E-05
Acetaldehyde	H	T	0.04 lb/MBF	10	0.42	1.85	0.42	1.85	0.84	3.70	0.68	2.96
Acetophenone	H	T	2.60E-07 lb/MMBtu	3	1.04E-05	4.56E-05	1.04E-05	4.56E-05	2.08E-05	9.11E-05	1.66E-05	7.29E-05
Acrolein	H	T	4.00E-03 lb/MBF	10	0.04	0.19	0.04	0.19	0.08	0.37	0.07	0.30
Benzene	H	T	2.70E-04 lb/MMBtu	3	0.01	0.05	0.01	0.05	0.02	0.09	0.02	0.08
Benzo(a)pyrene			2.60E-06 lb/MMBtu	1, 8	1.04E-04	4.56E-04	1.04E-04	4.56E-04	2.08E-04	9.11E-04	1.66E-04	7.29E-04
Carbon disulfide	H	T	1.30E-04 lb/MMBtu	3	5.20E-03	0.02	5.20E-03	0.02	0.01	0.05	8.32E-03	0.04
Carbon tetrachloride	H	T	8.90E-07 lb/MMBtu	3	3.56E-05	1.56E-04	3.56E-05	1.56E-04	7.12E-05	3.12E-04	5.70E-05	2.49E-04
Chlorine	H	T	7.90E-04 lb/MMBtu	1	0.03	0.14	0.03	0.14	0.06	0.28	0.05	0.22
Chlorobenzene	H	T	5.50E-10 lb/MMBtu	3	2.20E-08	9.64E-08	2.20E-08	9.64E-08	4.40E-08	1.93E-07	3.52E-08	1.54E-07
Chloroform	H	T	3.70E-05 lb/MMBtu	3	1.48E-03	6.48E-03	1.48E-03	6.48E-03	2.96E-03	0.01	2.37E-03	0.01
Crotonaldehyde			1.10E-05 lb/MMBtu	3, 7	4.40E-04	1.93E-03	4.40E-04	1.93E-03	8.80E-04	3.85E-03	7.04E-04	3.08E-03
Cumene	H	T	1.80E-05 lb/MMBtu	3	7.20E-04	3.15E-03	7.20E-04	3.15E-03	1.44E-03	6.31E-03	1.15E-03	5.05E-03
Di(2-ethylhexyl)phthalate	H	T	4.70E-08 lb/MMBtu	3	1.88E-06	8.23E-06	1.88E-06	8.23E-06	3.76E-06	1.65E-05	3.01E-06	1.32E-05
Dibutylphthalate	H	T	3.30E-05 lb/MMBtu	3	1.32E-03	5.78E-03	1.32E-03	5.78E-03	2.64E-03	0.01	2.11E-03	9.25E-03
Dioxin (as 2,3,7,8-TCDD)	H	T	8.60E-12 lb/MMBtu	1	3.44E-10	1.51E-09	3.44E-10	1.51E-09	6.88E-10	3.01E-09	5.50E-10	2.41E-09
Ethylbenzene	H	T	6.80E-06 lb/MMBtu	3	2.72E-04	1.19E-03	2.72E-04	1.19E-03	5.44E-04	2.38E-03	4.35E-04	1.91E-03
Ethylene dichloride	H	T	2.90E-05 lb/MMBtu	3	1.16E-03	5.08E-03	1.16E-03	5.08E-03	2.32E-03	0.01	1.86E-03	8.13E-03
Formaldehyde	H	T	0.065 lb/MBF	10	0.69	3.01	0.69	3.01	1.37	6.01	1.10	4.81
Hexachlorobenzene	H	T	1.00E-06 lb/MMBtu	3	4.00E-05	1.75E-04	4.00E-05	1.75E-04	8.00E-05	3.50E-04	6.40E-05	2.80E-04
Hexane	H	T	2.90E-04 lb/MMBtu	3	0.01	0.05	0.01	0.05	0.02	0.10	0.02	0.08
Hydrochloric acid	H	T	2.30E-03 lb/MMBtu	2	0.09	0.40	0.09	0.40	0.18	0.81	0.15	0.64
Isopropanol			3.00E-03 lb/MMBtu	3, 7	0.12	0.53	0.12	0.53	0.24	1.05	0.19	0.84
Methanol	H	T	0.18 lb/MBF	10	1.90	8.33	1.90	8.33	3.80	16.65	3.04	13.32
Methyl bromide	H	T	1.50E-05 lb/MMBtu	3	6.00E-04	2.63E-03	6.00E-04	2.63E-03	1.20E-03	5.26E-03	9.60E-04	4.20E-03
Methyl chloride	H	T	2.30E-05 lb/MMBtu	3	9.20E-04	4.03E-03	9.20E-04	4.03E-03	1.84E-03	8.06E-03	1.47E-03	6.45E-03
Methyl chloroform	H	T	4.20E-05 lb/MMBtu	3	1.68E-03	7.36E-03	1.68E-03	7.36E-03	3.36E-03	0.01	2.69E-03	0.01
Methyl ethyl ketone			2.40E-08 lb/MMBtu	3	9.60E-07	4.20E-06	9.60E-07	4.20E-06	1.92E-06	8.41E-06	1.54E-06	6.73E-06
Methyl isobutyl ketone	H	T	0.001 lb/MBF	4	0.01	0.05	0.01	0.05	0.02	0.09	0.02	0.07
Methylene chloride	H		3.50E-04 lb/MMBtu	3	0.01	0.06	0.01	0.06	0.03	0.12	0.02	0.10
Naphthalene	H	T	2.80E-05 lb/MMBtu	2, 8	1.12E-03	4.91E-03	1.12E-03	4.91E-03	2.24E-03	9.81E-03	1.79E-03	7.85E-03
n-Butyraldehyde			6.10E-05 lb/MMBtu	3, 7	2.44E-03	0.01	2.44E-03	0.01	4.88E-03	0.02	3.90E-03	0.02
PAC			7.83E-05 lb/ton	5, 8	3.13E-03	0.01	3.13E-03	0.01	6.26E-03	2.74E-02	5.01E-03	0.02
Pentachlorophenol	H	T	4.80E-08 lb/MMBtu	3	1.92E-06	8.41E-06	1.92E-06	8.41E-06	3.84E-06	1.68E-05	3.07E-06	1.35E-05
Phenol	H	T	0.01 lb/MBF	10	0.11	0.46	0.11	0.46	0.21	0.93	0.17	0.74
POM	H		2.88E-05 lb/MMBtu	1	1.15E-03	5.05E-03	1.15E-03	5.05E-03	2.30E-03	0.01	1.84E-03	8.07E-03
Propionaldehyde	H	T	4.00E-03 lb/MBF	10	0.04	0.19	0.04	0.19	0.08	0.37	0.07	0.30
Propylene dichloride	H	T	3.30E-05 lb/MMBtu	3	1.32E-03	5.78E-03	1.32E-03	5.78E-03	2.64E-03	0.01	2.11E-03	9.25E-03
Styrene	H	T	3.20E-05 lb/MMBtu	3	1.28E-03	5.61E-03	1.28E-03	5.61E-03	2.56E-03	0.01	2.05E-03	8.97E-03
Tetrachloroethylene	H	T	3.82E-05 lb/MMBtu	2	1.53E-03	6.69E-03	1.53E-03	6.69E-03	3.06E-03	0.01	2.44E-03	0.01
Toluene	H	T	0.0001 lb/MBF	4	1.06E-03	4.63E-03	1.06E-03	4.63E-03	2.11E-03	9.25E-03	1.69E-03	7.40E-03
Trichloroethylene	H		3.90E-05 lb/MMBtu	3	1.56E-03	6.83E-03	1.56E-03	6.83E-03	3.12E-03	0.01	2.50E-03	0.01
Trichlorofluoromethane			4.10E-05 lb/MMBtu	3, 7	1.64E-03	7.18E-03	1.64E-03	7.18E-03	3.28E-03	0.01	2.62E-03	0.01
Vinyl chloride	H		1.80E-05 lb/MMBtu	3	7.20E-04	3.15E-03	7.20E-04	3.15E-03	1.44E-03	6.31E-03	1.15E-03	5.05E-03
Xylenes	H	T	2.60E-06 lb/MMBtu	3	1.04E-04	4.56E-04	1.04E-04	4.56E-04	2.08E-04	9.11E-04	1.66E-04	7.29E-04
<i>Metal HAP/TAP</i>												
Antimony	H	T	7.90E-06 lb/MMBtu	1	3.16E-04	1.38E-03	3.16E-04	1.38E-03	6.32E-04	2.77E-03	5.06E-04	2.21E-03
Arsenic	H	T	3.70E-06 lb/MMBtu	3	1.48E-04	6.48E-04	1.48E-04	6.48E-04	2.96E-04	1.30E-03	2.37E-04	1.04E-03
Barium			2.00E-05 lb/MMBtu	3, 7	8.00E-04	3.50E-03	8.00E-04	3.50E-03	1.60E-03	7.01E-03	1.28E-03	5.61E-03
Beryllium	H	T	8.20E-07 lb/MMBtu	3	3.28E-05	1.44E-04	3.28E-05	1.44E-04	6.56E-05	2.87E-04	5.25E-05	2.30E-04
Cadmium	H	T	4.70E-06 lb/MMBtu	3	1.88E-04	8.23E-04	1.88E-04	8.23E-04	3.76E-04	1.65E-03	3.01E-04	1.32E-03
Chromium	H		6.60E-06 lb/MMBtu	3	2.64E-04	1.16E-03	2.64E-04	1.16E-03	5.28E-04	2.31E-03	4.22E-04	1.85E-03
Chromium VI	H	T	7.30E-06 lb/MMBtu	3, 6	2.92E-04	1.28E-03	2.92E-04	1.28E-03	5.84E-04	2.56E-03	4.67E-04	2.05E-03
Cobalt	H	T	4.20E-04 lb/MMBtu	3	0.02	0.07	0.02	0.07	0.03	0.15	0.03	0.12
Copper			1.30E-05 lb/MMBtu	3, 7	5.20E-04	2.28E-03	5.20E-04	2.28E-03	1.04E-03	4.56E-03	8.32E-04	3.64E-03
Lead	H		1.77E-05 lb/MMBtu	2	7.08E-04	3.10E-03	7.08E-04	3.10E-03	1.42E-03	6.20E-03	1.13E-03	4.96E-03
Manganese	H	T	1.81E-03 lb/MMBtu	2	0.07	0.32	0.07	0.32	0.14	0.63	0.12	0.51
Mercury	H	T	5.00E-07 lb/MMBtu	2	2.00E-05	8.76E-05	2.00E-05	8.76E-05	4.00E-05	1.75E-04	3.20E-05	1.40E-04
Nickel	H	T	4.80E-06 lb/MMBtu	3	1.92E-04	8.41E-04	1.92E-04	8.41E-04	3.84E-04	1.68E-03	3.07E-04	1.35E-03
Phosphorus	H	T	9.90E-05 lb/MMBtu	3	3.96E-03	0.02	3.96E-03	0.02	7.92E-03	0.03	6.34E-03	0.03
Selenium	H	T	6.20E-06 lb/MMBtu	3	2.48E-04	1.09E-03	2.48E-04	1.09E-03	4.96E-04	2.17E-03	3.97E-04	1.74E-03
Silver			9.90E-07 lb/MMBtu	3, 7	3.96E-05	1.73E-04	3.96E-05	1.73E-04	7.92E-05	3.47E-04	6.34E-05	2.78E-04
Thallium			1.90E-06 lb/MMBtu	3, 7	7.60E-05	3.33E-04	7.60E-05	3.33E-04	1.52E-04	6.66E-04	1.22E-04	5.33E-04
Largest HAP (Methanol)					1.90	8.33	1.90	8.33	3.80	16.65	3.04	13.32
Total HAP				9	3.49	15.31	3.49	15.31	6.99	30.61	5.59	24.49

1. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boilers* (September 2003).
2. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as used in the Title V renewal application for the West Fraser facility in Maplesville, Alabama (May 2014, MSOP No. 403-S005).
3. Per NCASI TB No. 858, Tables 20A and 20B, as used in the Title V renewal application for the West Fraser facility in Maplesville, Alabama (May 2014, MSOP No. 403-S005).
4. Per NCASI TB 845, as used in the Title V renewal application for the West Fraser facility in Maplesville, Alabama (May 2014, MSOP No. 403-S005).
5. Per the NCASI publication for Wood Products Facilities, as used in the Title V renewal application for the West Fraser facility in Maplesville, Alabama (May 2014, MSOP No. 403-S005).
6. Based on a July 7, 1999 memo from NCDQA, the chromium VI compounds represented are chromic acid emissions calculated in terms of the chromium VI equivalents.
7. Not a regulated HAP to TAP
8. Included in POM
9. Total HAP excludes naphthalene (POM) to avoid double counting emissions.
10. Appendix E of September 22, 2017 EPA document Subject: Development of a Provisional Emissions Calculations Tool for the Inclusion in the Final PCWP ICR
11. Point Source Emission are based on PSD Modeling guidance from ADEM. Point source emissions from the kilns are equal to 80% of the total emissions. Fugitive kiln emissions account for 20% of the total emissions.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-4b. Potential HAP/TAP Emissions from Startup of Direct-Fired Continuous Kilns (CDK1 & CDK2)

Pollutant	HAP	TAP	Emission Factor	Reference	CDK1		CDK2		Total Potential Emissions		
					Potential Emissions ³ (lb/yr)	(tpy)	Potential Emissions ³ (lb/yr)	(tpy)	(lb/yr)	(tpy)	
<i>Volatile HAP/TAP</i>											
1,3 Butadiene	H	T	1.48E-02 lb/10 ³ gal	1	4.44E-05	2.22E-08	4.44E-05	2.22E-08	8.88E-05	4.44E-08	
1,1,1-Trichloroethane	H	T	2.36E-04 lb/10 ³ gal	2	7.08E-07	3.54E-10	7.08E-07	3.54E-10	1.42E-06	7.08E-10	
Acenaphthylene	H	T	2.53E-05 lb/10 ³ gal	2	7.59E-08	3.80E-11	7.59E-08	3.80E-11	1.52E-07	7.59E-11	
Acenaphthene	H	T	2.11E-05 lb/10 ³ gal	2	6.33E-08	3.17E-11	6.33E-08	3.17E-11	1.27E-07	6.33E-11	
Acetaldehyde	H	T	0.3506 lb/10 ³ gal	1	1.05E-03	5.26E-07	1.05E-03	5.26E-07	2.10E-03	1.05E-06	
Acrolein	H	T	3.51E-01 lb/10 ³ gal	1	1.05E-03	5.26E-07	1.05E-03	5.26E-07	2.10E-03	1.05E-06	
Anthracene	H	T	1.22E-06 lb/10 ³ gal	2	3.66E-09	1.83E-12	3.66E-09	1.83E-12	7.32E-09	3.66E-12	
Benzene	H	T	4.40E-03 lb/10 ³ gal	1	1.32E-05	6.60E-09	1.32E-05	6.60E-09	2.64E-05	1.32E-08	
Benzo(a)anthracene	H	T	4.01E-06 lb/10 ³ gal	2	1.20E-08	6.02E-12	1.20E-08	6.02E-12	2.41E-08	1.20E-11	
Benzo(b,k)fluoranthene	H	T	1.48E-06 lb/10 ³ gal	2	4.44E-09	2.22E-12	4.44E-09	2.22E-12	8.88E-09	4.44E-12	
Benzo(g,h,i)perylene	H	T	2.26E-06 lb/10 ³ gal	2	6.78E-09	3.39E-12	6.78E-09	3.39E-12	1.36E-08	6.78E-12	
Chlorobenzene	H	T	2.00E-04 lb/10 ³ gal	1	6.00E-07	3.00E-10	6.00E-07	3.00E-10	1.20E-06	6.00E-10	
Chrysene	H	T	2.38E-06 lb/10 ³ gal	2	7.14E-09	3.57E-12	7.14E-09	3.57E-12	1.43E-08	7.14E-12	
Dibenz(a,h)anthracene	H	T	1.67E-06 lb/10 ³ gal	2	5.01E-09	2.51E-12	5.01E-09	2.51E-12	1.00E-08	5.01E-12	
Ethylbenzene	H	T	2.00E-04 lb/10 ³ gal	1	6.00E-07	3.00E-10	6.00E-07	3.00E-10	1.20E-06	6.00E-10	
Fluoranthene	H	T	4.84E-06 lb/10 ³ gal	2	1.45E-08	7.26E-12	1.45E-08	7.26E-12	2.90E-08	1.45E-11	
Fluorene	H	T	4.47E-06 lb/10 ³ gal	2	1.34E-08	6.71E-12	1.34E-08	6.71E-12	2.68E-08	1.34E-11	
Formaldehyde	H	T	0.3506 lb/10 ³ gal	1	1.05E-03	5.26E-07	1.05E-03	5.26E-07	2.10E-03	1.05E-06	
Hexane	H	T	3.50E-03 lb/10 ³ gal	1	1.05E-05	5.25E-09	1.05E-05	5.25E-09	2.10E-05	1.05E-08	
Hydrogen Chloride	H	T	1.86E-01 lb/10 ³ gal	1	5.59E-04	2.79E-07	5.59E-04	2.79E-07	1.12E-03	5.59E-07	
Indeno(1,2,3-cd)pyrene	H	T	2.14E-06 lb/10 ³ gal	2	6.42E-09	3.21E-12	6.42E-09	3.21E-12	1.28E-08	6.42E-12	
Naphthalene	H	T	5.30E-03 lb/10 ³ gal	1	1.59E-05	7.95E-09	1.59E-05	7.95E-09	3.18E-05	1.59E-08	
Total PAHs	H		4.45E-02 lb/10 ³ gal	1	1.34E-04	6.68E-08	1.34E-04	6.68E-08	2.67E-04	1.34E-07	
Phenanthrene	H	T	1.05E-05 lb/10 ³ gal	2	3.15E-08	1.58E-11	3.15E-08	1.58E-11	6.30E-08	3.15E-11	
Propylene	H	T	0.010 lb/10 ³ gal	1	3.00E-05	1.50E-08	3.00E-05	1.50E-08	6.00E-05	3.00E-08	
Pyrene	H	T	4.25E-06 lb/10 ³ gal	2	1.28E-08	6.38E-12	1.28E-08	6.38E-12	2.55E-08	1.28E-11	
Toluene	H	T	0.0044 lb/10 ³ gal	1	1.32E-05	6.60E-09	1.32E-05	6.60E-09	2.64E-05	1.32E-08	
Xylenes	H	T	1.60E-03 lb/10 ³ gal	1	4.80E-06	2.40E-09	4.80E-06	2.40E-09	9.60E-06	4.80E-09	
<i>Metal HAP/TAP</i>											
Arsenic	H	T	1.60E-03 lb/10 ³ gal	1	4.80E-06	2.40E-09	4.80E-06	2.40E-09	9.60E-06	4.80E-09	
Cadmium	H	T	1.50E-03 lb/10 ³ gal	1	4.50E-06	2.25E-09	4.50E-06	2.25E-09	9.00E-06	4.50E-09	
Chromium	H		6.00E-04 lb/10 ³ gal	1	1.80E-06	9.00E-10	1.80E-06	9.00E-10	3.60E-06	1.80E-09	
Chromium VI	H	T	1.00E-04 lb/10 ³ gal	1	3.00E-07	1.50E-10	3.00E-07	1.50E-10	6.00E-07	3.00E-10	
Copper	H	T	4.10E-03 lb/10 ³ gal	1	1.23E-05	6.15E-09	1.23E-05	6.15E-09	2.46E-05	1.23E-08	
Manganese	H	T	3.10E-03 lb/10 ³ gal	1	9.30E-06	4.65E-09	9.30E-06	4.65E-09	1.86E-05	9.30E-09	
Mercury	H	T	2.00E-03 lb/10 ³ gal	1	6.00E-06	3.00E-09	6.00E-06	3.00E-09	1.20E-05	6.00E-09	
Nickel	H	T	3.90E-03 lb/10 ³ gal	1	1.17E-05	5.85E-09	1.17E-05	5.85E-09	2.34E-05	1.17E-08	
Selenium	H	T	2.20E-03 lb/10 ³ gal	1	6.60E-06	3.30E-09	6.60E-06	3.30E-09	1.32E-05	6.60E-09	
Zinc	H	T	2.24E-02 lb/10 ³ gal	1	6.72E-05	3.36E-08	6.72E-05	3.36E-08	1.34E-04	6.72E-08	
Largest HAP (Acetaldehyde, Acrolein, Formaldehyde) Total HAP					4	1.05E-03 3.47E-03	5.26E-07 1.73E-06	1.05E-03 3.47E-03	5.26E-07 1.73E-06	2.10E-03 6.94E-03	1.05E-06 3.47E-06

- South Coast Air Quality Management District, Combustion Default Emission Factors (Revised December 2024), Toxic Air Contaminant Emission Factors for External Combustion Equipment: Diesel / Distillate oil
- AP-42, Section 1.3 Fuel Oil Combustion, Table 1.3-9
- Potential annual emissions were calculated using the following equations based on the units of the emission factor:
 $Potential\ emissions\ [lb/yr] = Emission\ factor\ [lb/1000\ gal] \times Annual\ fuel\ usage\ [gal/yr]$
 $Potential\ emissions\ [tpy] = Emission\ factor\ [lb/1000\ gal] \times Annual\ fuel\ usage\ [gal/yr] / 2,000\ [lb/ton]$
- Total HAP excludes naphthalene (POM) to avoid double counting emissions.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-5. Direct-Fired Natural Gas Kiln Operating Parameters

Operating Parameter	CKD3	CKD4	Unit
No. of Burners	1	1	
Max Hourly Heat Input	45	45	MMBtu/hr
Natural Gas HHV ¹	1,020	1,020	MMBtu/MMscf
Max. Annual Operation	8,760	8,760	hr/yr
Max Hourly CDK3/4 Capacity	11.42	11.42	MBF/hr
Max Annual CDK3/4 Capacity	100,000	100,000	MBF/yr
Max Hourly Gas Throughput ²	0.044	0.044	MMscf/hr/burner
Max Annual Gas Throughput ³	386.5	386.5	MMscf/yr/burner

1. Average higher heating value from AP-42 Section 1.4.
2. Calculated as Heat Input (MMBtu/hr) / HHV (MMBtu/MMscf)
3. Calculated as Heat Input (MMBtu/hr) / HHV (MMBtu/MMscf) x [Annual Operation (hr/yr) - Expected Downtime (hr/yr)]

Table B-6. Potential Direct-Fired Natural Gas Kiln Criteria & GHG Emissions

Pollutant	Combustion Emission Factor ¹⁻⁴ (lb/MMscf)	Wood Drying Emission Factor ⁵ (lb/MBF)	Combustion Emissions ⁶		Wood Drying Emissions ⁷		Total Emissions ^{7,8}		Point Source Emissions ⁸	
			Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
<i>Criteria Pollutants</i>										
Filterable PM	--	1.30E-02	--	--	0.15	0.65	0.30	1.30	0.237	1.04
Filterable PM ₁₀	--	1.30E-02	--	--	0.15	0.65	0.30	1.30	0.237	1.04
Filterable PM _{2.5}	--	1.30E-02	--	--	0.15	0.65	0.30	1.30	0.237	1.04
Condensable PM	--	9.00E-03	--	--	0.10	0.45	0.21	0.90	0.164	0.72
Total PM	0.52	2.20E-02	0.023	0.100	0.25	1.100	0.55	2.401	0.439	1.921
Total PM ₁₀	0.52	2.20E-02	0.023	0.100	0.25	1.100	0.55	2.401	0.439	1.921
Total PM _{2.5}	0.43	2.20E-02	0.019	0.083	0.25	1.100	0.54	2.366	0.432	1.892
NO _x	50.00	--	2.21	9.66	--	--	4.41	19.3	3.53	15.46
CO	84.00	--	3.71	16.23	--	--	7.41	32.5	5.93	25.97
VOC	5.50	4.75	0.24	1.06	54.2	237.6	108.96	477.3	87.17	381.81
SO ₂	0.60	--	2.65E-02	0.12	--	--	5.29E-02	0.23	4.24E-02	0.19
Lead	5.00E-04	--	2.21E-05	9.66E-05	--	--	4.41E-05	1.93E-04	3.53E-05	1.55E-04
<i>Greenhouse Gases</i>										
CO ₂	119,317	--	5,264	23,056	--	--	10,528	46,112	8,422	36,890
CH ₄	2.25	--	0.10	0.43	--	--	0.20	0.87	0.16	0.70
N ₂ O	0.22	--	9.92E-03	4.35E-02	--	--	1.98E-02	0.09	1.59E-02	6.95E-02
CO ₂ e	119,439	--	5,269	23,080	--	--	10,539	46,160	8,431	36,928

1. Emission factors excluding PM and PM species per AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-1 and 1.4-2. The NO_x and CO emission factors are for small boilers (less than 100 MMBtu/hr) with Low NO_x control.
2. Per 40 CFR Part 98, Subpart C, Tables C-1 and C-2. The CO₂, CH₄, and N₂O emission factors are the default factors for natural gas combustion. The default factors provided are in units of kg/MMBtu. The factors have been converted to lb/MMscf using a standard kg-to-lb conversion factor and by multiplying by the HHV for natural gas.
3. The CO₂e factor is calculated based on the emission factor for CO₂, CH₄, and N₂O and the global warming potential (GWP) for each pollutant per 40 CFR 98, Subpart A, Table A-1:

CO ₂	1
CH ₄	28
N ₂ O	265
4. Emission factors for PM, PM₁₀, and PM_{2.5} per EPA 2014 National Emissions Inventory. https://www.epa.gov/sites/default/files/2018-11/natgas_procgas_lpg_pm_efs_not_ap42_032012_revisions.xlsx
5. Filterable PM and condensable PM emission factors are from the Georgia Pacific (GP) Talladega Mill application for natural gas fired CDKs, which were also used in the Westervelt Thomasville air permit application submitted to ADEM in 2019. These emission factors were also approved at GP's Mill in Warrenton, GA and represents the average factor plus two standard deviations from August 2012 testing at this site. All condensable PM is assumed to be PM₁₀ and PM_{2.5}. The VOC emission factor is recommended by the State of GA (EPD) for all direct-fired kilns and has been approved by EPA Region 4. This factor was also utilized by the Westervelt Thomasville Mill application for direct-fired natural gas CDKs in 2019.
6. Potential Emissions (lb/hr) = Emission Factor (lb/MMscf) x Hourly Fuel Input Capacity (MMscf/hr)
Potential Emissions (tpy) = Emission Factor (lb/MMscf) x Annual Fuel Input Capacity (MMscf/yr) / 2,000 lbs/ton
7. Potential Emissions (lb/hr) = Emission Factor (lb/MBF) x Hourly Fuel Input Capacity (MBF/hr) x number of kilns
Potential Emissions (tpy) = Emission Factor (lb/MBF) x Annual Capacity (MBF/yr) / 2,000 lbs/ton x number of kilns
8. Point Source Emission are based on PSD Modeling guidance from ADEM. Point source emissions from the kilns are equal to 80% of the total emissions. Fugitive kiln emissions account for 20% of the total emissions.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-7. Direct-Fired Natural Gas Burners Speciated HAP Potential Emissions

Pollutant	HAP? (Y/N)	Emission Factor		Potential Emissions ⁴ CDK3		Potential Emissions ⁴ CDK4		Total Emissions ⁵ CDK3 & CDK4		Point Source Emissions ⁵ CDK3 & CDK4	
		(lb/MBF) ^{1,2}	(lb/MMscf) ³	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
2-Methylnaphthalene	Y		2.40E-05	1.06E-06	4.64E-06	1.06E-06	4.64E-06	2.12E-06	9.28E-06	1.69E-06	7.42E-06
3-Methylchloranthrene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
7,12-Dimethylbenz(a)anthracene	Y		1.60E-05	7.06E-07	3.09E-06	7.06E-07	3.09E-06	1.41E-06	6.18E-06	1.13E-06	4.95E-06
Acenaphthene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Acenaphthylene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Acetaldehyde	Y	4.50E-02		0.51	2.25	0.51	2.25	1.03	4.50	0.82	3.60
Acrolein	Y	7.20E-03		8.22E-02	0.36	8.22E-02	0.36	0.16	0.72	0.13	0.58
Anthracene	Y		2.40E-06	1.06E-07	4.64E-07	1.06E-07	4.64E-07	2.12E-07	9.28E-07	1.69E-07	7.42E-07
Benz(a)anthracene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Benzene	Y		2.10E-03	9.26E-05	4.06E-04	9.26E-05	4.06E-04	1.85E-04	8.12E-04	1.48E-04	6.49E-04
Benzo(a)pyrene	Y		1.20E-06	5.29E-08	2.32E-07	5.29E-08	2.32E-07	1.06E-07	4.64E-07	8.47E-08	3.71E-07
Benzo(b)fluoranthene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Benzo(g,h,i)perylene	Y		1.20E-06	5.29E-08	2.32E-07	5.29E-08	2.32E-07	1.06E-07	4.64E-07	8.47E-08	3.71E-07
Benzo(k)fluoranthene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Butane	N		2.10	9.26E-02	0.41	9.26E-02	0.41	0.19	0.81	0.15	0.65
Chrysene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Dibenzo(a,h)anthracene	Y		1.20E-06	5.29E-08	2.32E-07	5.29E-08	2.32E-07	1.06E-07	4.64E-07	8.47E-08	3.71E-07
Dichlorobenzene	Y		1.20E-03	5.29E-05	2.32E-04	5.29E-05	2.32E-04	1.06E-04	4.64E-04	8.47E-05	3.71E-04
Ethane	N		3.10	0.14	0.60	0.14	0.60	0.27	1.20	0.22	0.96
Fluoranthene	Y		3.00E-06	1.32E-07	5.80E-07	1.32E-07	5.80E-07	2.65E-07	1.16E-06	2.12E-07	9.28E-07
Fluorene	Y		2.80E-06	1.24E-07	5.41E-07	1.24E-07	5.41E-07	2.47E-07	1.08E-06	1.98E-07	8.66E-07
Formaldehyde	Y	4.00E-02		0.46	2.00	0.46	2.00	0.91	4.00	0.73	3.20
Hexane	Y		1.80	7.94E-02	0.35	7.94E-02	0.35	0.16	0.70	0.13	0.56
Indeno(1,2,3-cd)pyrene	Y		1.80E-06	7.94E-08	3.48E-07	7.94E-08	3.48E-07	1.59E-07	6.96E-07	1.27E-07	5.57E-07
Methanol	Y	0.16		1.84	8.05	1.84	8.05	3.68	16.10	2.94	12.88
Naphthalene	Y		6.10E-04	2.69E-05	1.18E-04	2.69E-05	1.18E-04	5.38E-05	2.36E-04	4.31E-05	1.89E-04
Pentane	N		2.60	0.11	0.50	0.11	0.50	0.23	1.00	0.18	0.80
Phenanthrene	Y		1.70E-05	7.50E-07	3.29E-06	7.50E-07	3.29E-06	1.50E-06	6.57E-06	1.20E-06	5.26E-06
Phenol	Y	2.70E-02		0.31	1.35	0.31	1.35	0.62	2.70	0.49	2.16
Propane	N		1.60	7.06E-02	0.31	7.06E-02	0.31	0.14	0.62	0.11	0.49
Pyrene	Y		5.00E-06	2.21E-07	9.66E-07	2.21E-07	9.66E-07	4.41E-07	1.93E-06	3.53E-07	1.55E-06
Toluene	Y		3.40E-03	1.50E-04	6.57E-04	1.50E-04	6.57E-04	3.00E-04	1.31E-03	2.40E-04	1.05E-03
Arsenic	Y		2.00E-04	8.82E-06	3.86E-05	8.82E-06	3.86E-05	1.76E-05	7.73E-05	1.41E-05	6.18E-05
Barium	N		4.40E-03	1.94E-04	8.50E-04	1.94E-04	8.50E-04	3.88E-04	1.70E-03	3.11E-04	1.36E-03
Beryllium	Y		1.20E-05	5.29E-07	2.32E-06	5.29E-07	2.32E-06	1.06E-06	4.64E-06	8.47E-07	3.71E-06
Cadmium	Y		1.10E-03	4.85E-05	2.13E-04	4.85E-05	2.13E-04	9.71E-05	4.25E-04	7.76E-05	3.40E-04
Chromium	Y		1.40E-03	6.18E-05	2.71E-04	6.18E-05	2.71E-04	1.24E-04	5.41E-04	9.88E-05	4.33E-04
Cobalt	Y		8.40E-05	3.71E-06	1.62E-05	3.71E-06	1.62E-05	7.41E-06	3.25E-05	5.93E-06	2.60E-05
Copper	N		8.50E-04	3.75E-05	1.64E-04	3.75E-05	1.64E-04	7.50E-05	3.29E-04	6.00E-05	2.63E-04
Manganese	Y		3.80E-04	1.68E-05	7.34E-05	1.68E-05	7.34E-05	3.35E-05	1.47E-04	2.68E-05	1.17E-04
Mercury	Y		2.60E-04	1.15E-05	5.02E-05	1.15E-05	5.02E-05	2.29E-05	1.00E-04	1.84E-05	8.04E-05
Molybdenum	N		1.10E-03	4.85E-05	2.13E-04	4.85E-05	2.13E-04	9.71E-05	4.25E-04	7.76E-05	3.40E-04
Nickel	Y		2.10E-03	9.26E-05	4.06E-04	9.26E-05	4.06E-04	1.85E-04	8.12E-04	1.48E-04	6.49E-04
Selenium	Y		2.40E-05	1.06E-06	4.64E-06	1.06E-06	4.64E-06	2.12E-06	9.28E-06	1.69E-06	7.42E-06
Vanadium	N		2.30E-03	1.01E-04	4.44E-04	1.01E-04	4.44E-04	2.03E-04	8.89E-04	1.62E-04	7.11E-04
Zinc	N		2.90E-02	1.28E-03	5.60E-03	1.28E-03	5.60E-03	2.56E-03	1.12E-02	2.05E-03	8.97E-03
HAP Totals:				3.28	14.36	3.28	14.36	6.56	28.72	5.25	22.98
Natural Gas Burner Total HAP (tpy):				14.36	14.36	14.36	14.36	28.72	28.72	22.98	22.98

- Emission factors for formaldehyde, methanol, and acetaldehyde are recommended by the State of GA (EPD) for all direct-fired kilns and have been approved by EPA Region 4.
- Emission factors for acrolein and phenol are from the recent PSD permit application submitted for the Rex Lumber Mill (ADEM Facility No. 210-S006) in Troy, AL.
- Emission factors per AP-42, Section 1.4 Natural Gas Combustion, Tables 1.4-3 and 1.4-4.
- Potential Emissions (lb/hr) = Emission Factor (lb/MMscf) x Hourly Fuel Input Capacity (MMscf/hr)
 Potential Emissions (tpy) = Emission Factor (lb/MMscf) x Annual Fuel Input Capacity (MMscf/yr) / 2,000 lbs/ton
 Potential Emissions (lb/hr) = Emission Factor (lb/MBF) x Max Hourly CDK3 Capacity (MBF/hr)
 Potential Emissions (tpy) = Emission Factor (lb/MBF) x Max Annual CDK3 Capacity (MBF/yr) / 2,000 lbs/ton
- Point Source Emission are based on PSD Modeling guidance from ADEM. Point source emissions from the kilns are equal to 80% of the total emissions. Fugitive kiln emissions account for 20% of the total emissions.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-8. Fuel Silo Operating Parameters

Operating Parameter	Value	Unit
PM Hourly Emission Rate ¹	1.33	(lb PM/hr)
PM Removal Efficiency ²	99.97	(%)
Max. Throughput ³	88,400	(lb sawdust/hr)
Max. Throughput ³	44.2	(ton/hr)
Annual Throughput ⁴	38,933	(tons sawdust)
Hourly Throughput ⁴	6.49	(ton/hr)
Operating Hours ⁵	6,000	(hours)

1. Particulate matter hourly emission rate is based on the maximum throughput after the listed removal efficiency.

Removal Efficiency: 99.97 %

PM Hourly Emission Rate = 44.2 ton/hr * (1 - Control Efficiency %)

2. Removal efficiency provided by Heumann Environmental Company and Western Pneumatics, LLC.

3. Maximum throughput is obtained by assuming all bark hogging and log chipping throughputs could be conveyed through the fuel silos then divided by 2 fuel silos. Actual throughput will be limited by the burner capacity as no additional storage of sawdust will be available onsite.

(Bark hogging + Log Chipping)/2 fuel silos = 23.9 + 64.5 tons/hr divided by 2 fuel silos = 44.2 tons/hr

4. Annual throughput is obtained by assuming the burner runs at full capacity for 8,760 hrs/yr using only sawdust:

40 MMBtu/hr x 8,760 hrs/yr ÷ 9 MMBtu/ton = 38,933 tons/yr

5. Operating hours: 6,000 hr/yr

Table B-9. Fuel Silo Potential Emissions

Controlled Emissions - Fuel Silo Cyclone 1				
Pollutant	Emission Factors ^{1,2}		(lb/hr)	(tpy)
PM	0.2	lb/ton Sawdust	1.33	3.98
PM ₁₀	0.0300	lb PM ₁₀ /lb PM	0.18	0.55
PM _{2.5}	0.003	lb PM _{2.5} /lb PM	0.02	0.06

Controlled Emissions - Fuel Silo Cyclone 2				
Pollutant	Emission Factors ^{1,2}		(lb/hr)	(tpy)
PM	0.2	lb/ton Sawdust	1.33	3.98
PM ₁₀	0.0300	lb PM ₁₀ /lb PM	0.18	0.55
PM _{2.5}	0.003	lb PM _{2.5} /lb PM	0.02	0.06

1. Emission factor was obtained from EPA Region 10 Particle Matter Potential to Emit Emission Factors for Activities at Sawmills, May 2014.

2. Based upon aerodynamic particle-size distribution conducted by New South - Bucks in January 2025. PM₁₀ and PM_{2.5} are conservatively estimated as 13.8% and 1.4% respectively, of total particulate emissions.

PM₁₀ = 13.80%

PM_{2.5} = 1.40%

Table B-10. Fuel Silo Particulate Matter SMS Emission Limits²

Pollutant	Fuel Silo Cyclone 1		Fuel Silo Cyclone 2	
	(lb/hr) ¹	(tpy)	(lb/hr) ¹	(tpy)
PM	1.46	4.38	1.46	4.38
PM ₁₀	0.20	0.60	0.20	0.60
PM _{2.5}	0.020	0.061	0.020	0.061

1. SMS limit for PM equals 110% of calculated lb/hr emission rate.

SMS Limit = PM/PM₁₀/PM_{2.5} x 110%

2. ADEM Regulatory Emission Rate: E=17.31P^{0.16}, where P= 44.2 tons / hr. E=31.74 lb/hr

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-11. Planer Mill PM Emissions

EP ID	Emission Description	Control Device ¹	Exit Temp (°F)	Exhaust Flow Rate ²		PM ₁₀ Loading Rate ³ (gr/dscf)	PM _{2.5} Loading Rate ³ (gr/dscf)	Baghouse Control Efficiency ⁴ (%)	Filterable PM ^{4,5}		Total PM ₁₀ ^{4,5}		Total PM _{2.5} ^{4,5}	
				(acfm)	(scfm)				(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
DC-1	Planer Mill Baghouse Exhaust	Cyclone to Baghouse	70	99,090	98,654	0.004	0.004	95.0	0.169	0.507	0.169	0.507	0.169	0.507
PM Emission totals (tpy)⁶										0.51		0.51		0.51

1. Baghouse collects wood shavings and dust for the wood processing equipment, chipper, saw, and planer.
2. Exhaust flow rate (acfm) provided by New South. Exhaust flow converted to scfm assuming ambient exhaust temperatures at 1 atm.
3. Based on manufacturer's guarantee. Filterable PM value used for PM, PM₁₀, and PM_{2.5}.
4. Potential Hourly PM Emissions (lb/hr) = Exhaust Grain Loading Rate (gr./dscf) x Exhaust Air Flow Rate (dscf/min) x (60 min/hr) x (lb/7,000 gr.) x (1 - Control Efficiency %).
Baghouse Manufacture's Guarantee: 95.0 %
5. Potential Annual PM Emissions (tpy) = Potential Hourly Emissions (lb/hr) x Potential Annual Operation (hr/yr) / 2,000 (lb/ton) x ((1 - Control Efficiency %). Potential Operation: 6000 hrs/yr

Table B-12. Planer Mill Particulate Matter SMS Emission Limits^{1,2}

Pollutant	Total Planer Mill Cyclone Emissions	
	(lb/MBF)	(tpy)
PM	0.0029	0.558
PM ₁₀	0.0029	0.558
PM _{2.5}	0.0029	0.558

1. SMS limit for PM equals 110% of tested and calculated lb/MBF rate.
SMS Limit = PM/PM₁₀/PM_{2.5} x 110%
2. ADEM Regulatory Emission Rate: E=17.31P^{0.16}, where P= 40 tons / hr. E= 31.23 lb/hr

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-13. Sawmill Operating Parameters

Operating Parameter	Value	Unit
Annual Throughput	385,000	MBF lumber
Operating Hours	6,000	hr/yr
Hourly Throughput	64.17	MBF/hr
Max. Design Throughput	96.25	MBF/hr
Log Debarking Throughput ¹	1,674,750	tons log/ yr
Bark Hogging Throughput	167,475	tons bark/yr
Log Chipping Throughput	452,183	tons chips/yr

1. Typical lumber production operations require approximately 4.35 tons of log to produce 1 MBF of sellable lumber.

Table B-14. Potential Emissions for Sawing and Debarking

Emission Source	EUID	Annual Hours of Operation ¹	Pollutant	Emission Factor (lb/ton) ^{2,3}	Control Efficiency ^{4,5} (%)	Potential Emissions	
						(lb/hr) ⁶	(tpy) ⁷
Log Debarking	FUG1	6,000	Filterable PM	0.024	70%	2.01	6.03
			Filterable PM ₁₀	0.012	70%	1.00	3.01
			Filterable PM _{2.5} ⁷	0.00600	70%	0.50	1.51
Mechanical Conveyance of Bark to Bark Hog	FUG2	6,000	Filterable PM ²	5.52E-05	0%	1.54E-03	4.62E-03
			Filterable PM ₁₀ ²	2.61E-05	0%	7.29E-04	2.19E-03
			Filterable PM _{2.5}	3.95E-06	0%	1.10E-04	3.31E-04
Bark Hogging	FUG3	6,000	Filterable PM ²	0.024	90%	6.70E-02	0.20
			Filterable PM ₁₀ ²	0.012	90%	3.35E-02	0.10
			Filterable PM _{2.5}	0.006	90%	1.67E-02	5.02E-02
Mechanical Conveyance of Scraps to Chipper	FUG4	6,000	Filterable PM ²	5.52E-05	0%	4.16E-03	1.25E-02
			Filterable PM ₁₀ ²	2.61E-05	0%	1.97E-03	5.90E-03
			Filterable PM _{2.5}	3.95E-06	0%	2.98E-04	8.94E-04
Log Chipping	FUG5	6,000	Filterable PM ²	0.024	70%	0.54	1.63
			Filterable PM ₁₀ ²	0.012	70%	0.27	0.81
			Filterable PM _{2.5}	0.006	70%	0.14	0.41
Sawing	FUG6	6,000	Filterable PM ²	0.350	90%	9.77	29.31
			Filterable PM ₁₀ ²	0.175	90%	4.88	14.65
			Filterable PM _{2.5}	0.088	90%	2.44	7.33

- New South is limiting the annual operation for the sawmill to match planer mill operations. 6000 hr/yr
- EPA Region 10 Particulate Matter Potential to Emit Emissions for Activities at sawmills, excluding Boilers, located in Pacific Northwest Indian County, May 2014
- Emission Factor from page 136 in AP-42, Section 13.2.4, Aggregate Handling and Storage piles. Reference in Scotch Gulf Lumber LLC's MSOP Renewal - April 2020.
- The sawmill is fully enclosed. Based on guidance by the Texas Commission on Environmental Quality (TCEQ) Wood industry Post Control Factors for Log Sawing (Appendix A1); Enclosed by Building = 90% post-control.
- A 70% control efficiency was assumed for debarking and chipper as there will be a partial enclosure of the individual building. Control efficiency from EPA Region 10 particulate matter potential to emit emissions for activities at sawmills, excluding boilers, located in pacific northwest indian country, May 2014.
- Potential Annual Emissions (lb/hr) = Potential Annual Emissions (tpy) * 2,000 (lb/ton) / Annual Hours of Operation (hr/yr)
- Potential Annual Emissions (tpy) = Emission factor (lb/ton) × [1 - Control Efficiency (%)] × Potential Throughput (ton/yr) / 2,000 (lb/ton)

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-15. Inputs for Emissions from Road Travel

Source	Number of Trucks Per Year	Average Weight (W) ² (tons)	Distance Traveled per Round Trip ¹		Events Per Year (Days)	Number of Trucks Per Day	Vehicle Miles Traveled				
			Paved Roads (ft)	Unpaved Roads (ft)			Paved Roads (VMT/day)	Paved Roads (VMT/yr)	Unpaved Roads (VMT/day)	Unpaved Roads (VMT/yr)	
Shavings Truck	--	40.0	2,112	--	365			--	--		
Chip Truck	6,449	40.0	2,112	--	365	17.67	7.07	2,580	--	--	--
Log Truck	23,941	40.0	2,112	--	365	65.59	26.24	9,576	--	--	--
Bark Truck	2,394	40.0	2,112	--	365	6.56	2.62	958	--	--	--
Lumber Truck	6,000	40.0	2,112	--	365	16.44	6.58	2,400	--	--	--

1. Paved roadway milage estimated at 0.36 miles plus 10% for maximum distance traveled onsite round trip. No unpaved roadways will be available for proposed vehicle traffic.
2. Average weight based on maximum vehicle capacity.

Table B-16. Potential Fugitive Emissions from Road Travel

Source	EUID	Emission Factor ¹ (lb/VMT)			Potential Fugitive Emissions ²					
		PM	PM ₁₀	PM _{2.5}	Filterable PM (lb/hr)	Filterable PM ₁₀ (lb/hr)	Filterable PM _{2.5} (lb/hr)	Filterable PM (tpy)	Filterable PM ₁₀ (tpy)	Filterable PM _{2.5} (tpy)
<i>Paved Road Travel</i>										
Shavings Truck	FT01	3.99E-02	7.97E-03	1.96E-03	--	--	--	--	--	--
Chip Truck		3.99E-02	7.97E-03	1.96E-03	1.17E-02	2.35E-03	5.76E-04	5.14E-02	1.03E-02	2.52E-03
Log Truck		3.99E-02	7.97E-03	1.96E-03	4.36E-02	8.72E-03	2.14E-03	0.19	3.82E-02	9.37E-03
Bark Truck		3.99E-02	7.97E-03	1.96E-03	4.36E-03	8.72E-04	2.14E-04	1.91E-02	3.82E-03	9.37E-04
Lumber Truck		3.99E-02	7.97E-03	1.96E-03	1.09E-02	2.18E-03	5.36E-04	4.78E-02	9.57E-03	2.35E-03
Total Road Emissions					7.06E-02	1.41E-02	3.47E-03	0.31	6.19E-02	1.52E-02

1. Paved Roads Emission Factor (lb/VMT) = $[k (sL)^{0.91} \times (W)^{1.02}] \times (100\% - \% \text{ control efficiency})$, per AP-42 Section 13.2.1, Paved Roads (Jan. 2011), Equation 1, with variables defined as follows:

PM - k (lb/VMT) = 0.011 Particle size multiplier for PM per AP-42, Table 13.2.1-1
 PM₁₀ - k (lb/VMT) = 0.0022 Particle size multiplier for PM₁₀ per AP-42, Table 13.2.1-1
 PM_{2.5} - k (lb/VMT) = 0.00054 Particle size multiplier for PM_{2.5} per AP-42, Table 13.2.1-1

sL (g/m²) = 0.53 Road surface average silt loading from Georgia-Pacific Wood Products LLC - Warrenton Lumber Facility PSD Air Permit Application No. 237752 submitted to Georgia EPD in April 2018.

W = Average weight (in tons) of the vehicle traveling the road

% control efficiency = 85.0 Control applied for reducing speed limit and good work practices

2. Potential emissions calculated as appropriate emission factor multiplied by vehicle miles traveled per time period.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-17. Emergency Fire Pump Engine (ENG1) Operating Parameters

Parameter	ENG1	Units
Fuel	Diesel	
Maximum Power Output ¹	227.5	kW
Rated Horsepower ¹	305	hp, output
Potential Operation ²	100	hr/yr
Heating Value of Diesel ³	19,300	Btu/lb
Power Conversion ³	7,000	Btu/hp-hr
Heat Consumption ⁴	2.14	MMBtu/hr

1. Manufacturer specified parameters.
2. Engine will operate a maximum of 100 hrs/yr, per NSPS IIII Regulations.
3. Engine capacity converted from HP to MMBtu/hr assuming heat rate of: 7,000 Btu/hp-hr per Footnote in AP-42 Section 3.3 Table 3.3-1

Table B-18. Fire Pump Criteria Pollutant & GHG Potential Emissions

Pollutant	Emission Factor ³		ENG1 Potential Emissions ^{7,8}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
NO _x ¹	6.58E-03	--	2.01	0.10
VOC	2.47E-03	--	0.75	0.04
CO ¹	5.76E-03	--	1.76	0.09
Filterable PM ¹	3.29E-04	--	0.10	5.02E-03
Total PM ⁴	2.20E-03	--	0.67	3.36E-02
Total PM ₁₀ ⁴	2.20E-03	--	0.67	3.36E-02
Total PM _{2.5} ⁴	2.20E-03	--	0.67	3.36E-02
SO ₂ ²	1.09E-05	--	3.32E-03	1.66E-04
CO ₂	1.15	--	350.8	17.54
CH ₄ ⁵	4.63E-05	6.61E-03	1.41E-02	7.06E-04
N ₂ O ⁵	9.26E-06	1.32E-03	2.82E-03	1.41E-04
CO ₂ e ⁶	1.15	--	351.9	17.6

1. ENG1 water pump PM, CO, NO_x emissions factors are based on NSPS IIII emission limit.
NSPS IIII Emission Limit
NO_x = 4.0 g/kW-hr
NMHC = g/kW-hr
CO = 3.5 g/kW-hr
Filterable PM = 0.20 g/kW-hr
- Emission factors were converted from g/kW-hr to lb/hp-hr by dividing 608 per AP-42, Section 3.3, Table 3.3-1 footnote ^a.
2. Sulfur content (15 ppmv) in accordance with 40 CFR 60.4207(b) as required by NSPS Subpart IIII.
3. Otherwise emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-1 (04/25). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1MMBtu/1,000,000 Btu.
4. All PM is assumed to have a diameter of less than one micron. Additionally, there is no CPM factor available; thus, Total PM = Total PM₁₀ = Total PM_{2.5}.
5. CH₄ and N₂O factors are from 40 CFR Part 98, Table C-2 for petroleum fuels. Factors were converted from kg/MMBtu to lb/MMBtu.
CH₄ = 3.00E-03 kg/MMBtu
N₂O = 6.00E-04 kg/MMBtu
6. CO₂e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2025. GWPs used for CO₂, CH₄, and N₂O are listed below.
CO₂ 1
CH₄ 28
N₂O 265
7. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
8. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-19. Fire Pump Potential HAP Emissions

Pollutant	Emission Factor ¹		ENG1 Potential Emissions ^{2,3}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
Acetaldehyde	5.37E-06	7.67E-04	1.64E-03	8.19E-05
Acrolein	6.48E-07	9.25E-05	1.97E-04	9.87E-06
Benzene	6.53E-06	9.33E-04	1.99E-03	9.96E-05
Formaldehyde	8.26E-06	1.18E-03	2.52E-03	1.26E-04
Toluene	2.86E-06	4.09E-04	8.73E-04	4.37E-05
Xylenes	2.00E-06	2.85E-04	6.08E-04	3.04E-05
1,3 Butadiene	2.74E-07	3.91E-05	8.35E-05	4.17E-06
Naphthalene	5.94E-07	8.48E-05	1.81E-04	9.05E-06
Acenaphthylene	3.54E-08	5.06E-06	1.08E-05	5.40E-07
Acenaphthene	9.94E-09	1.42E-06	3.03E-06	1.52E-07
Fluorene	2.04E-07	2.92E-05	6.23E-05	3.12E-06
Phenanthrene	2.06E-07	2.94E-05	6.28E-05	3.14E-06
Anthracene	1.31E-08	1.87E-06	3.99E-06	2.00E-07
Fluoranthene	5.33E-08	7.61E-06	1.62E-05	8.12E-07
Pyrene	3.35E-08	4.78E-06	1.02E-05	5.10E-07
Benzo(a)anthracene	1.18E-08	1.68E-06	3.59E-06	1.79E-07
Chrysene	2.47E-09	3.53E-07	7.54E-07	3.77E-08
Benzo(b)fluoranthene	6.94E-10	9.91E-08	2.12E-07	1.06E-08
Benzo(k)fluoranthene	1.09E-09	1.55E-07	3.31E-07	1.65E-08
Benzo(a)pyrene	1.32E-09	1.88E-07	4.01E-07	2.01E-08
Indeno(1,2,3-cd)pyrene	2.63E-09	3.75E-07	8.01E-07	4.00E-08
Dibenz(a,h)anthracene	4.08E-09	5.83E-07	1.24E-06	6.22E-08
Benzo(g,h,i)perylene	3.42E-09	4.89E-07	1.04E-06	5.22E-08
Total HAP:			4.14E-04	
Max Single HAP:			1.26E-04	

1. Emission factors from AP-42 Section 3.3 (Gasoline and Diesel Industrial Engines), Table 3.3-2 (10/96). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1 MMBtu/1,000,000 Btu.

2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-20. Emergency Generator No. 1 Operating Parameters

Parameter	GEN1	Units
Fuel	Natural Gas	
Maximum Power Output ¹	35	kW
Rated Horsepower ¹	54	hp
Potential Operation ²	100	hr/yr
Heating Value of Natural Gas ³	1,020	Btu/scf
Heat Consumption ³	0.38	MMBtu/hr

1. Manufacturer specified parameters.
2. Engine will operate a maximum of 100 hrs/yr, per NSPS JJJJ Regulations.
3. Engine capacity converted from HP to MMBtu/hr assuming heat rate of: 7,000 Btu/hp-hr

Table B-21. Emergency Generator Criteria Pollutant & GHG Potential Emissions

Pollutant	Emission Factor ²		GEN1 Potential Emissions ^{6,7}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
NO _x ¹	2.20E-02	--	1.19	0.06
VOC	0.12	--	6.37	0.32
CO ¹	0.85	--	46.05	2.30
Filterable PM ³	--	7.71E-05	2.91E-05	1.46E-06
Condensable PM ³	--	9.91E-03	3.75E-03	1.87E-04
Total PM ₁₀ ³	--	7.71E-05	2.91E-05	1.46E-06
Total PM _{2.5} ³	--	7.71E-05	2.91E-05	1.46E-06
SO ₂ ²	--	5.88E-04	2.22E-04	1.11E-05
CO ₂	--	110.0	41.58	2.08
CH ₄ ⁴	8.33E-10	2.20E-03	4.50E-08	2.25E-09
N ₂ O ⁴	8.33E-11	2.20E-04	4.50E-09	2.25E-10
CO ₂ e ⁵	--	110.1	41.63	2.08

1. GEN1 CO, NO_x emissions factors are based on NSPS JJJJ emission limit.
NSPS JJJJ Emission Limit
NO_x = 10.0 g/HP-hr
CO = 387.0 g/HP-hr
Emission factors were converted to lb/hp-hr by dividing 453.8 g/lb.
2. Otherwise emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2. 4-Stroke Lean-Burn Engines (10/24).
3. All PM is assumed to have a diameter of less than one micron; thus, Filterable PM = PM_{10(filterable)} = PM_{2.5(filterable)}.
PM Condensable = PM Condensable Inorganic + PM Condensable Organic
4. CH₄ and N₂O factors are from 40 CFR Part 98, Table C-2 for natural gas. Factors were converted from kg/MMBtu to lb/MMBtu.
CH₄ = 1.00E-03 kg/MMBtu
N₂O = 1.00E-04 kg/MMBtu
5. CO₂e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2025. GWPs used for CO₂, CH₄, and N₂O are listed below.
CO₂ 1
CH₄ 28
N₂O 265
6. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
Emissions (lb/hr) = Emission Factor (lb/MMBtu) * Power Conversion (MMBtu/hr).
7. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-22. Emergency Generator Potential HAP Emissions

Pollutant	Emission Factor ¹		GEN1 Potential Emissions ^{2,3}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	1.51E-11	4.00E-05	8.16E-10	4.08E-11
1,1,2-Trichloroethane	1.20E-11	3.18E-05	6.49E-10	3.25E-11
1,1-Dichloroethane	8.92E-12	2.36E-05	4.82E-10	2.41E-11
1,2,3-Trimethylbenzene	8.69E-12	2.30E-05	4.69E-10	2.35E-11
1,2,4-Trimethylbenzene	5.41E-12	1.43E-05	2.92E-10	1.46E-11
1,2-Dichloroethane	8.92E-12	2.36E-05	4.82E-10	2.41E-11
1,2-Dichloropropane	1.02E-11	2.69E-05	5.49E-10	2.75E-11
1,3,5-Trimethylbenzene	1.28E-11	3.38E-05	6.90E-10	3.45E-11
1,3-Butadiene	1.01E-10	2.67E-04	5.45E-09	2.73E-10
1,3-Dichloropropene	9.98E-12	2.64E-05	5.39E-10	2.69E-11
2-Methylnaphthalene	1.25E-11	3.32E-05	6.78E-10	3.39E-11
2,2,4-Trimethylpentane	9.45E-11	2.50E-04	5.10E-09	2.55E-10
Acenaphthene	4.73E-13	1.25E-06	2.55E-11	1.28E-12
Acenaphthylene	2.09E-12	5.53E-06	1.13E-10	5.64E-12
Acetaldehyde	3.16E-09	8.36E-03	1.71E-07	8.53E-09
Acrolein	1.94E-09	5.14E-03	1.05E-07	5.25E-09
Benzene	1.66E-10	4.40E-04	8.98E-09	4.49E-10
Benzo(b)fluoranthene	6.27E-14	1.66E-07	3.39E-12	1.69E-13
Benzo(e)pyrene	1.57E-13	4.15E-07	8.47E-12	4.24E-13
Benzo(g,h,i)perylene	1.56E-13	4.14E-07	8.45E-12	4.23E-13
Biphenyl	8.01E-11	2.12E-04	4.33E-09	2.16E-10
Butane	2.04E-10	5.41E-04	1.10E-08	5.52E-10
Butyr/Isobutyraldehyde	3.82E-11	1.01E-04	2.06E-09	1.03E-10
Carbon Tetrachloride	1.39E-11	3.67E-05	7.49E-10	3.75E-11
Chlorobenzene	1.15E-11	3.04E-05	6.21E-10	3.10E-11
Chloroethane	7.07E-13	1.87E-06	3.82E-11	1.91E-12
Chloroform	1.08E-11	2.85E-05	5.82E-10	2.91E-11
Chrysene	2.62E-13	6.93E-07	1.41E-11	7.07E-13
Cyclopentane	8.58E-11	2.27E-04	4.63E-09	2.32E-10
Ethane	3.97E-08	0.11	2.14E-06	1.07E-07
Ethylbenzene	1.50E-11	3.97E-05	8.10E-10	4.05E-11
Ethylene Dibromide	1.67E-11	4.43E-05	9.04E-10	4.52E-11
Fluoranthene	4.20E-13	1.11E-06	2.27E-11	1.13E-12
Fluorene	2.14E-12	5.67E-06	1.16E-10	5.79E-12
Formaldehyde	2.00E-08	5.28E-02	1.08E-06	5.39E-08
Methanol	9.45E-10	2.50E-03	5.10E-08	2.55E-09
Methylcyclohexane	4.65E-10	1.23E-03	2.51E-08	1.26E-09
Methylene Chloride	7.56E-12	2.00E-05	4.08E-10	2.04E-11
n-Hexane	4.20E-10	1.11E-03	2.27E-08	1.13E-09
n-Nonane	4.16E-11	1.10E-04	2.25E-09	1.12E-10
n-Octane	1.33E-10	3.51E-04	7.16E-09	3.58E-10
n-Pentane	9.83E-10	2.60E-03	5.31E-08	2.65E-09
Naphthalene	2.81E-11	7.44E-05	1.52E-09	7.59E-11
PAH	1.02E-11	2.69E-05	5.49E-10	2.75E-11
Phenanthrene	3.93E-12	1.04E-05	2.12E-10	1.06E-11
Phenol	9.07E-12	2.40E-05	4.90E-10	2.45E-11
Propane	1.58E-08	4.19E-02	8.55E-07	4.28E-08
Pyrene	5.14E-13	1.36E-06	2.78E-11	1.39E-12
Styrene	8.92E-12	2.36E-05	4.82E-10	2.41E-11
Tetrachloroethane	9.37E-13	2.48E-06	5.06E-11	2.53E-12
Toluene	1.54E-10	4.08E-04	8.33E-09	4.16E-10
Vinyl Chloride	5.63E-12	1.49E-05	3.04E-10	1.52E-11
Xylene	6.96E-11	1.84E-04	3.76E-09	1.88E-10
Total HAP:			2.29E-07	
Max Single HAP:			1.07E-07	

1. Emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2 (07/00). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1 MMBtu/1,000,000 Btu.

2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-23. Emergency Generator No. 2 Operating Parameters

Parameter	GEN2	Units
Fuel	Natural Gas	
Maximum Power Output ¹	35	kW
Rated Horsepower ¹	54	hp
Potential Operation ²	100	hr/yr
Heating Value of Natural Gas ³	1,020	Btu/scf
Heat Consumption ³	0.38	MMBtu/hr

1. Manufacturer specified parameters.
2. Engine will operate a maximum of 100 hrs/yr, per NSPS JJJJ Regulations.
3. Engine capacity converted from HP to MMBtu/hr assuming heat rate of: 7,000 Btu/hp-hr

Table B-24. Emergency Generator Criteria Pollutant & GHG Potential Emissions

Pollutant	Emission Factor ²		GEN2 Potential Emissions ^{6,7}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
NO _x ¹	2.20E-02	--	1.19	0.06
VOC	0.12	--	6.37	0.32
CO ¹	0.85	--	46.05	2.30
Filterable PM ³	--	7.71E-05	2.91E-05	1.46E-06
Condensable PM ³	--	9.91E-03	3.75E-03	1.87E-04
Total PM ₁₀ ³	--	7.71E-05	2.91E-05	1.46E-06
Total PM _{2.5} ³	--	7.71E-05	2.91E-05	1.46E-06
SO ₂ ²	--	5.88E-04	2.22E-04	1.11E-05
CO ₂	--	110.0	41.58	2.08
CH ₄ ⁴	8.33E-10	2.20E-03	4.50E-08	2.25E-09
N ₂ O ⁴	8.33E-11	2.20E-04	4.50E-09	2.25E-10
CO ₂ e ⁵	--	110.1	41.63	2.08

1. GEN2 CO, NO_x emissions factors are based on NSPS JJJJ emission limit.
NSPS JJJJ Emission Limit
NO_x = 10.0 g/HP-hr
CO = 387.0 g/HP-hr
Emission factors were converted to lb/hp-hr by dividing 453.8 g/lb.
2. Otherwise emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2. 4-Stroke Lean-Burn Engines (10/24).
3. All PM is assumed to have a diameter of less than one micron; thus, Filterable PM = PM_{10(filterable)} = PM_{2.5(filterable)}.
PM Condensable = PM Condensable Inorganic + PM Condensable Organic
4. CH₄ and N₂O factors are from 40 CFR Part 98, Table C-2 for natural gas. Factors were converted from kg/MMBtu to lb/MMBtu.
CH₄ = 1.00E-03 kg/MMBtu
N₂O = 1.00E-04 kg/MMBtu
5. CO₂e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2025. GWPs used for CO₂, CH₄, and N₂O are listed below.
CO₂ 1
CH₄ 28
N₂O 265
6. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
Emissions (lb/hr) = Emission Factor (lb/MMBtu) * Power Conversion (MMBtu/hr).
7. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-25. Emergency Generator Potential HAP Emissions

Pollutant	Emission Factor ¹		GEN2 Potential Emissions ^{2,3}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	1.51E-11	4.00E-05	8.16E-10	4.08E-11
1,1,2-Trichloroethane	1.20E-11	3.18E-05	6.49E-10	3.25E-11
1,1-Dichloroethane	8.92E-12	2.36E-05	4.82E-10	2.41E-11
1,2,3-Trimethylbenzene	8.69E-12	2.30E-05	4.69E-10	2.35E-11
1,2,4-Trimethylbenzene	5.41E-12	1.43E-05	2.92E-10	1.46E-11
1,2-Dichloroethane	8.92E-12	2.36E-05	4.82E-10	2.41E-11
1,2-Dichloropropane	1.02E-11	2.69E-05	5.49E-10	2.75E-11
1,3,5-Trimethylbenzene	1.28E-11	3.38E-05	6.90E-10	3.45E-11
1,3-Butadiene	1.01E-10	2.67E-04	5.45E-09	2.73E-10
1,3-Dichloropropene	9.98E-12	2.64E-05	5.39E-10	2.69E-11
2-Methylnaphthalene	1.25E-11	3.32E-05	6.78E-10	3.39E-11
2,2,4-Trimethylpentane	9.45E-11	2.50E-04	5.10E-09	2.55E-10
Acenaphthene	4.73E-13	1.25E-06	2.55E-11	1.28E-12
Acenaphthylene	2.09E-12	5.53E-06	1.13E-10	5.64E-12
Acetaldehyde	3.16E-09	8.36E-03	1.71E-07	8.53E-09
Acrolein	1.94E-09	5.14E-03	1.05E-07	5.25E-09
Benzene	1.66E-10	4.40E-04	8.98E-09	4.49E-10
Benzo(b)fluoranthene	6.27E-14	1.66E-07	3.39E-12	1.69E-13
Benzo(e)pyrene	1.57E-13	4.15E-07	8.47E-12	4.24E-13
Benzo(g,h,i)perylene	1.56E-13	4.14E-07	8.45E-12	4.23E-13
Biphenyl	8.01E-11	2.12E-04	4.33E-09	2.16E-10
Butane	2.04E-10	5.41E-04	1.10E-08	5.52E-10
Butyr/Isobutyraldehyde	3.82E-11	1.01E-04	2.06E-09	1.03E-10
Carbon Tetrachloride	1.39E-11	3.67E-05	7.49E-10	3.75E-11
Chlorobenzene	1.15E-11	3.04E-05	6.21E-10	3.10E-11
Chloroethane	7.07E-13	1.87E-06	3.82E-11	1.91E-12
Chloroform	1.08E-11	2.85E-05	5.82E-10	2.91E-11
Chrysene	2.62E-13	6.93E-07	1.41E-11	7.07E-13
Cyclopentane	8.58E-11	2.27E-04	4.63E-09	2.32E-10
Ethane	3.97E-08	0.11	2.14E-06	1.07E-07
Ethylbenzene	1.50E-11	3.97E-05	8.10E-10	4.05E-11
Ethylene Dibromide	1.67E-11	4.43E-05	9.04E-10	4.52E-11
Fluoranthene	4.20E-13	1.11E-06	2.27E-11	1.13E-12
Fluorene	2.14E-12	5.67E-06	1.16E-10	5.79E-12
Formaldehyde	2.00E-08	5.28E-02	1.08E-06	5.39E-08
Methanol	9.45E-10	2.50E-03	5.10E-08	2.55E-09
Methylcyclohexane	4.65E-10	1.23E-03	2.51E-08	1.26E-09
Methylene Chloride	7.56E-12	2.00E-05	4.08E-10	2.04E-11
n-Hexane	4.20E-10	1.11E-03	2.27E-08	1.13E-09
n-Nonane	4.16E-11	1.10E-04	2.25E-09	1.12E-10
n-Octane	1.33E-10	3.51E-04	7.16E-09	3.58E-10
n-Pentane	9.83E-10	2.60E-03	5.31E-08	2.65E-09
Naphthalene	2.81E-11	7.44E-05	1.52E-09	7.59E-11
PAH	1.02E-11	2.69E-05	5.49E-10	2.75E-11
Phenanthrene	3.93E-12	1.04E-05	2.12E-10	1.06E-11
Phenol	9.07E-12	2.40E-05	4.90E-10	2.45E-11
Propane	1.58E-08	4.19E-02	8.55E-07	4.28E-08
Pyrene	5.14E-13	1.36E-06	2.78E-11	1.39E-12
Styrene	8.92E-12	2.36E-05	4.82E-10	2.41E-11
Tetrachloroethane	9.37E-13	2.48E-06	5.06E-11	2.53E-12
Toluene	1.54E-10	4.08E-04	8.33E-09	4.16E-10
Vinyl Chloride	5.63E-12	1.49E-05	3.04E-10	1.52E-11
Xylene	6.96E-11	1.84E-04	3.76E-09	1.88E-10
Total HAP:			2.29E-07	
Max Single HAP:			1.07E-07	

1. Emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2 (07/00). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1 MMBtu/1,000,000 Btu.

2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-26. Emergency Generator No. 3 Operating Parameters

Parameter	GEN3	Units
Fuel	Natural Gas	
Maximum Power Output ¹	45	kW
Rated Horsepower ¹	69	hp
Potential Operation ²	100	hr/yr
Heating Value of Natural Gas ³	1,020	Btu/scf
Heat Consumption ³	0.48	MMBtu/hr

1. Manufacturer specified parameters.
2. Engine will operate a maximum of 100 hrs/yr, per NSPS JJJJ Regulations.
3. Engine capacity converted from HP to MMBtu/hr assuming heat rate of: 7,000 Btu/hp-hr

Table B-27. Emergency Generator Criteria Pollutant & GHG Potential Emissions

Pollutant	Emission Factor ²		GEN3 Potential Emissions ^{6,7}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
NO _x ¹	2.20E-02	--	1.52	0.08
VOC	0.12	--	8.14	0.41
CO ¹	0.85	--	58.84	2.94
Filterable PM ³	--	7.71E-05	3.72E-05	1.86E-06
Condensable PM ³	--	9.91E-03	4.79E-03	2.39E-04
Total PM ₁₀ ³	--	7.71E-05	3.72E-05	1.86E-06
Total PM _{2.5} ³	--	7.71E-05	3.72E-05	1.86E-06
SO ₂ ²	--	5.88E-04	2.84E-04	1.42E-05
CO ₂	--	110.0	53.13	2.66
CH ₄ ⁴	1.06E-09	2.20E-03	7.35E-08	3.67E-09
N ₂ O ⁴	1.06E-10	2.20E-04	7.35E-09	3.67E-10
CO ₂ e ⁵	--	110.1	53.19	2.66

1. GEN3 CO, NO_x emissions factors are based on NSPS JJJJ emission limit.
NSPS JJJJ Emission Limit
NO_x = 10.0 g/HP-hr
CO = 387.0 g/HP-hr
Emission factors were converted to lb/hp-hr by dividing 453.8 g/lb.
2. Otherwise emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2. 4-Stroke Lean-Burn Engines (10/24).
3. All PM is assumed to have a diameter of less than one micron; thus, Filterable PM = PM_{10(filterable)} = PM_{2.5(filterable)}.
PM Condensable = PM Condensable Inorganic + PM Condensable Organic
4. CH₄ and N₂O factors are from 40 CFR Part 98, Table C-2 for natural gas. Factors were converted from kg/MMBtu to lb/MMBtu.
CH₄ = 1.00E-03 kg/MMBtu
N₂O = 1.00E-04 kg/MMBtu
5. CO₂e is calculated using Global Warming Potentials (GWPs) from 40 CFR Part 98, Subpart A, Table A-1 effective January 1, 2025. GWPs used for CO₂, CH₄, and N₂O are listed below.
CO₂ = 1
CH₄ = 28
N₂O = 265
6. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).
Emissions (lb/hr) = Emission Factor (lb/MMBtu) * Power Conversion (MMBtu/hr).
7. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-28. Emergency Generator Potential HAP Emissions

Pollutant	Emission Factor ¹		GEN3 Potential Emissions ^{2,3}	
	(lb/hp-hr)	(lb/MMBtu)	(lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	1.93E-11	4.00E-05	1.33E-09	6.67E-11
1,1,2-Trichloroethane	1.54E-11	3.18E-05	1.06E-09	5.30E-11
1,1-Dichloroethane	1.14E-11	2.36E-05	7.87E-10	3.93E-11
1,2,3-Trimethylbenzene	1.11E-11	2.30E-05	7.67E-10	3.83E-11
1,2,4-Trimethylbenzene	6.91E-12	1.43E-05	4.77E-10	2.38E-11
1,2-Dichloroethane	1.14E-11	2.36E-05	7.87E-10	3.93E-11
1,2-Dichloropropane	1.30E-11	2.69E-05	8.96E-10	4.48E-11
1,3,5-Trimethylbenzene	1.63E-11	3.38E-05	1.13E-09	5.63E-11
1,3-Butadiene	1.29E-10	2.67E-04	8.90E-09	4.45E-10
1,3-Dichloropropene	1.28E-11	2.64E-05	8.80E-10	4.40E-11
2-Methylnaphthalene	1.60E-11	3.32E-05	1.11E-09	5.53E-11
2,2,4-Trimethylpentane	1.21E-10	2.50E-04	8.33E-09	4.17E-10
Acenaphthene	6.04E-13	1.25E-06	4.17E-11	2.08E-12
Acenaphthylene	2.67E-12	5.53E-06	1.84E-10	9.21E-12
Acetaldehyde	4.04E-09	8.36E-03	2.79E-07	1.39E-08
Acrolein	2.48E-09	5.14E-03	1.71E-07	8.57E-09
Benzene	2.13E-10	4.40E-04	1.47E-08	7.33E-10
Benzo(b)fluoranthene	8.02E-14	1.66E-07	5.53E-12	2.77E-13
Benzo(e)pyrene	2.00E-13	4.15E-07	1.38E-11	6.92E-13
Benzo(g,h,i)perylene	2.00E-13	4.14E-07	1.38E-11	6.90E-13
Biphenyl	1.02E-10	2.12E-04	7.07E-09	3.53E-10
Butane	2.61E-10	5.41E-04	1.80E-08	9.01E-10
Butyr/Isobutyraldehyde	4.88E-11	1.01E-04	3.37E-09	1.68E-10
Carbon Tetrachloride	1.77E-11	3.67E-05	1.22E-09	6.12E-11
Chlorobenzene	1.47E-11	3.04E-05	1.01E-09	5.07E-11
Chloroethane	9.03E-13	1.87E-06	6.23E-11	3.12E-12
Chloroform	1.38E-11	2.85E-05	9.50E-10	4.75E-11
Chrysene	3.35E-13	6.93E-07	2.31E-11	1.15E-12
Cyclopentane	1.10E-10	2.27E-04	7.57E-09	3.78E-10
Ethane	5.07E-08	0.11	3.50E-06	1.75E-07
Ethylbenzene	1.92E-11	3.97E-05	1.32E-09	6.62E-11
Ethylene Dibromide	2.14E-11	4.43E-05	1.48E-09	7.38E-11
Fluoranthene	5.36E-13	1.11E-06	3.70E-11	1.85E-12
Fluorene	2.74E-12	5.67E-06	1.89E-10	9.45E-12
Formaldehyde	2.55E-08	5.28E-02	1.76E-06	8.80E-08
Methanol	1.21E-09	2.50E-03	8.33E-08	4.17E-09
Methylcyclohexane	5.94E-10	1.23E-03	4.10E-08	2.05E-09
Methylene Chloride	9.66E-12	2.00E-05	6.67E-10	3.33E-11
n-Hexane	5.36E-10	1.11E-03	3.70E-08	1.85E-09
n-Nonane	5.31E-11	1.10E-04	3.67E-09	1.83E-10
n-Octane	1.70E-10	3.51E-04	1.17E-08	5.85E-10
n-Pentane	1.26E-09	2.60E-03	8.67E-08	4.33E-09
Naphthalene	3.59E-11	7.44E-05	2.48E-09	1.24E-10
PAH	1.30E-11	2.69E-05	8.96E-10	4.48E-11
Phenanthrene	5.02E-12	1.04E-05	3.47E-10	1.73E-11
Phenol	1.16E-11	2.40E-05	8.00E-10	4.00E-11
Propane	2.02E-08	4.19E-02	1.40E-06	6.98E-08
Pyrene	6.57E-13	1.36E-06	4.53E-11	2.27E-12
Styrene	1.14E-11	2.36E-05	7.87E-10	3.93E-11
Tetrachloroethane	1.20E-12	2.48E-06	8.27E-11	4.13E-12
Toluene	1.97E-10	4.08E-04	1.36E-08	6.80E-10
Vinyl Chloride	7.20E-12	1.49E-05	4.97E-10	2.48E-11
Xylene	8.89E-11	1.84E-04	6.13E-09	3.07E-10
Total HAP:			3.74E-07	
Max Single HAP:			1.75E-07	

1. Emission factors from AP-42 Section 3.2 (Natural Gas-fired Reciprocating Engines), Table 3.2-2 (07/00). Emission factors in lb/MMBtu were converted to lb/hp-hr by multiplying the power conversion factor of 7,000 Btu/hp-hr and 1 MMBtu/1,000,000 Btu.

2. Short-term emissions are calculated as follows:
Emissions (lb/hr) = Emission Factor (lb/hp-hr) * Engine Capacity (hp).

3. Annual emissions are calculated as follows:
Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Annual Operation (hr/yr) / 2,000 (lb/ton).

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-29. Tank Throughputs

Source Number	Tank Name	Material Stored	Tank Capacity (gallons)	Throughput (gallon/yr)
DST1	Diesel Storage Tank	Distillate Fuel Oil No. 2	700	17,000
GST1	Gasoline Storage Tank	Gasoline (RVP 15.0)	350	6,500

Table B-30. Product Properties

Distillate Fuel Oil No. 2			Gasoline (RVP 15.0)		
Parameter	Value	Units	Parameter	Value	Units
Vapor Molecular Weight	130	lb/lb _{mol}	Vapor Molecular Weight	66	lb/lb _{mol}
Liquid Molecular Weight	188	lb/lb _{mol}	Liquid Molecular Weight	92	lb/lb _{mol}
Vapor pressure ¹		kPa at 20°C	Vapor pressure ¹		kPa at 20°C
	0.006	psia at 20°C		7.000	psia at 20°C
Vapor Temperature	60	(assumed °F)	Vapor Temperature	60	(assumed °F)
feet/meter	3.28		feet/meter	3.28	

1. True Vapor Pressure at 60°F for Distillate Fuel No. 2 and Gasoline RVP13 from AP42 7.1, Table 7.1-2 "Properties of Selected Petroleum Liquids". RVP 13 properties were used as a substitute for RVP 15.

Table B-31. Tank Emission Parameters No. 1

Tank No.	Tank Capacity (Liters)	Tank Diameter ¹ D (ft)	Tank Height ¹ (ft)	Tank Throughput (bbl/yr)	Tank Throughput (gal/yr)	Vapor Space	Vapor Space	Effective Tank	Effective Tank
						Volume V _v (ft ³)	Outage H _{vo} (ft)	Diameter (Horizontal Tank) D _E (ft)	Height (Horizontal Tank) H _E (ft)
DST1	2,650	4.00	6.00	405	17,000	38	1.57	5.53	3.14
GST1	1,325	4.00	8.00	155	6,500	-	-	-	-
AP-42 Section 7.1 Basis -->						Eqn. 1-3	Eqn. 1-16	Eq 1-14	Eq 1-15

1. Tank dimensions for DST1 and GST1 assumed based on "typical" tank dimensions for specified capacity.

Table B-32. Tank Emission Parameters No. 2

Tank No.	Vapor Expansion Factor K _E	Vented Vapor Saturation Factor K _S	Vapor Density W _V (lb/ft ³)	Avg Daily Ambient Temp. Range dT _A (°F)	Average Daily Ambient Maximum Temp. ¹ T _{AX} (°F)	Average Daily Ambient Minimum Temp. ¹ T _{AN} (°F)	Daily Total Solar Insulation Factor ¹ I (Btu/ft ² -d)	Paint Solar Absorptance, a ² (a)	Surface True Vapor Pressure P _{VA} (psia)	Avg Vapor Temp T _V (°R)	Annual Sum of Liquid Level Increases ΣH _{OL}	Turnovers N	Annual Turnover Factor K _N
DST1	0.01	1.000	1.40E-04	0.00	76.70	57.60	1,388	0.17	0.006	520.00	94.68	30.14	1.00
GST1	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eqn. 1-12	Eqn. 1-21	Eqn. 1-22	Eqn. 1-11	Table 7.1-7	Table 7.1-7	Table 7.1-7	Table 7.1-6	Table 7.1-2	Table 7.1-2	Eq 1-37	Eq 1-36	Eqn. 1-35

1. Meteorological data obtained from AP-42 Section 7.1, *Organic Liquid Storage Tanks* (June 2020) for Mobile, AL.

2. Solar absorptance factor for new white tank.

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-33. Potential Tank Emissions

Tank No.	Fixed Roof Standing Storage Loss ^{3,4}	Fixed Roof Standing Storage Loss	Fixed Roof Working Loss Calculation	Fixed Roof Working Loss Calculation	Potential Emissions ^{1,2}		
	L_s (lb/yr)	L_s (tpy)	L_w (lb/yr)	L_w (tpy)	$L_s + L_w$ (lb/hr) [4]	(lb/yr)	(tpy) [5]
DST1	0.02	0.00	0.32	1.59E-04	3.81E-05	0.33	1.67E-04
GST1	6.50	0.00	74.75	3.74E-02	9.28E-03	81.25	4.06E-02
	Eqn. 1-2		Eqn. 1-35		Eqn. 1-1		
	Total VOC Emissions =				0.01	81.58	0.04

1. Potential Emissions (lb/hr) = [Fixed Roof Standing Storage Loss (lb/yr) + Fixed Roof Working Loss (lb/yr)] / 8,760 (hr/yr)

2. Potential Emissions (tpy) = Hourly Emissions (lb/hr) * 8,760 (hr/yr) / 2,000 (lb/ton)

3. Per AP-42 7.1 "For underground horizontal tanks, assume that no breathing or standing losses occur ($L_s = 0$) because the insulating nature of the earth limits the diurnal temperature change... standing losses from underground gasoline tanks, which can experience relatively fast vapor growth after the ingestion of air and dilution of the headspace, are addressed in Section 5.2 of AP-42."

4. Emissions from Gasoline tank estimated using AP-42 5.2.

GST emissions from breathing and emptying from AP-42 Section 5.2, Table 5.2-7 are

1.0 lb/10³ gal Throughput

GST emissions from filling per AP-42 Section 5.2.2.2 are

7.3 lb/10³ gal transferred gasoline (submerged filling)

11.5 lb/10³ gal transferred gasoline (splash filling)

**Appendix B - Detailed Emissions Calculations
New South Lumber Company - Bucks Sawmill**

Table B-34. Summary of Facility-wide Particulate Matter SMS Emission Limits & Proposed Compliance Tracking

EUID No	Emission Unit Descriptive	Emission Unit Production Basis						Filterable PM				Total PM ₁₀				Total PM _{2.5}			
		Hourly	Units	Annual	Units	APCD ID No	Control Device Description	lb/hr	lb/prod	Units	tpy	lb/hr	lb/prod	Units	tpy	lb/hr	lb/prod	Units	tpy
CDK1	Continuous Kiln No. 1	10.559	MBF/hr	92,500	MBF/yr	N/A	None	0.60	0.0568	lb/MBF	2.627	0.879	0.0832	lb/MBF	3.848	0.836	0.0792	lb/MBF	3.663
	Abort Stack Use	N/A	N/A	N/A	N/A	N/A	None	--	--	--	0.010	--	--	--	0.014	--	--	--	0.013
CDK2	Continuous Kiln No. 2	10.559	MBF/hr	92,500	MBF/yr	N/A	None	0.60	0.0568	lb/MBF	2.627	0.879	0.0832	lb/MBF	3.848	0.836	0.0792	lb/MBF	3.663
	Abort Stack Use	N/A	N/A	N/A	N/A	N/A	None	--	--	--	0.010	--	--	--	0.014	--	--	--	0.013
CDK3	Continuous Kiln No. 3	11.416	MBF/hr	100,000	MBF/yr	N/A	None	0.119	0.0104	lb/MBF	0.520	0.219	0.0192	lb/MBF	0.960	0.2161	0.0189	lb/MBF	0.946
CDK4	Continuous Kiln No. 4	11.416	MBF/hr	100,000	MBF/yr	N/A	None	0.119	0.0104	lb/MBF	0.520	0.219	0.0192	lb/MBF	0.960	0.2161	0.0189	lb/MBF	0.946
PLN1	Planer Mill	64.2	MBF/hr	385,000	MBF/yr	DC-1	Dust System	0.186	0.0029	lb/MBF	0.558	0.186	0.0029	lb/MBF	0.558	0.186	0.0029	lb/MBF	0.558
ENG1	Emer. Fire Water Pump	N/A	N/A	N/A	N/A	N/A	None	1.00E-01	--	--	5.02E-03	6.71E-01	--	--	3.36E-02	6.71E-01	--	--	3.36E-02
GEN1	Emer. Gen. Engine No. 1	N/A	N/A	N/A	N/A	N/A	None	2.91E-05	--	--	1.46E-06	2.91E-05	--	--	1.46E-06	2.91E-05	--	--	1.46E-06
GEN2	Emer. Gen. Engine No. 2	N/A	N/A	N/A	N/A	N/A	None	2.91E-05	--	--	1.46E-06	2.91E-05	--	--	1.46E-06	2.91E-05	--	--	1.46E-06
GEN3	Emer. Gen. Engine No. 3	N/A	N/A	N/A	N/A	N/A	None	3.72E-05	--	--	1.86E-06	3.72E-05	--	--	1.86E-06	3.72E-05	--	--	1.86E-06
SC01	Fuel Silo Cyclone No. 1 ¹	6.489	ton/hr	38,933	tons/yr	N/A	Cyclone	1.46	0.2248	lb/ton	4.38	0.20	0.0310	lb/ton	0.60	0.0204	0.00315	lb/ton	0.061
SC02	Fuel Silo Cyclone No. 2 ¹	6.489	ton/hr	38,933	tons/yr	N/A	Cyclone	1.46	0.2248	lb/ton	4.38	0.20	0.0310	lb/ton	0.60	0.0204	0.00315	lb/ton	0.061
Total TPY²								15.63				11.44				9.96			

1. Fuel Silo Cyclone production basis is in terms of pound per ton of sawdust. The sawdust throughput is limited based on combustion capacity of the kiln burner.

2. Proposed annual PSD compliance tracking equation is as follows:

Filterable PM = Total PM ₁₀ = Total PM _{2.5} =	Biomass Kilns EF^a 0.0568 lb/MBF 0.0832 lb/MBF 0.0792 lb/MBF	x	Biomass Kiln Production EF Values Fixed based on PTE.	x	Gas Kilns EF^a 0.0104 lb/MBF 0.0192 lb/MBF 0.0189 lb/MBF	x	Gas Kiln Production MBF/yr Mill Records & Tracking	+	BM Kiln Startups^b hr/yr hr/yr hr/yr	x	Startup EF (tons/hr)^c 0.0002128 EF Values Fixed based on PTE.	+	Planer EF 0.0029 lb/MBF 0.0029 lb/MBF 0.0029 lb/MBF	x	Planer Production EF Established through Stack Testing ^d	+	Equation continues on next line...
	Divided by 2,000 lb/ton																
	...Equation is carried forward from line above.																
	Divided by 2,000 lb/ton																
Divided by 2,000 lb/ton																	
Divided by 2,000 lb/ton																	
Divided by 2,000 lb/ton																	
= Facility-Wide Limit < SER ^g (Rolling 12-month basis)																	

- a.) For all kilns (biomass and gas-fired), the production-based emission factor is for point-source emissions only and excludes the 20% fugitives.
- b.) NSLC proposes to track hours of abort stack usage, but requests that no limit on abort stack usage be placed in the permits. NSLC will track overall emissions using the equation above and will report compliance on a rolling 12-month basis.
- c.) Biomass kiln startup EF factor is derived by dividing the annual emissions from startup in Table B-3b by the total startup hours in Table B-2.
- d.) Emission factors that are established through stack testing (e.g., the planer mill and the fuel silo cyclones) will be updated once initial testing is completed at the Bucks mill. NSLC proposes to use the production-based PTE limit basis proposed in this equation until such time as the initial testing is completed.
- e.) Non-emergency engine operation would be limited to 100 hr/yr per the NSPS regulations. However, emergency operation is not limited by any federal regulations. Additionally, any time that the emergency engines would be operating for emergency purposes, the mill would be down and therefore no lumber production or emissions from lumber production would occur during this time. Therefore, any emergency operation of the engines would be offsetting due to the mill outage. For these reasons, NSLC requests limits on non-emergency operation of the engines only and not a group annual limit on total operation. NSLC will track operations for both emergency and non-emergency purposes and will demonstrate compliance with the annual PM limits.
- f.) Engine lb/hr emission factors for each engine are included in Table B-34 above.
- g.) Total PM_{2.5} Example Calculation: Total PM_{2.5} (tpy) = [Kiln 1 Normal Op] [(0.0792 lb/MBF x 92,500 MBF/yr) / 2,000 lb/ton] + [Kiln 2 Normal Op] [(0.0791 lb/MBF x 92,500 MBF/yr) / 2,000 lb/ton] + [Biomass Kiln Startup] [96 hr/yr x 0.000276 ton/hr] + [Kiln 3] [0.0189 lb/MBF x 100,000 MBF/yr] + [Kiln 4] [0.0189 lb/MBF x 100,000 MBF/yr] + [Planer] [(0.0029 lb/MBF x 385,000 MBF/yr) / 2,000 lb/ton] + [Fuel Silo 1] [(0.0204 lb/hr x 6,000 hr/yr) / 2,000 lb/ton] + [Fuel Silo 2] [(0.0204 lb/hr x 6,000 hr/yr) / 2,000 lb/ton] + [ENG 1] [(0.671 lb/hr x 100 hr/yr) / 2,000 lb/ton] + [GEN 1] [(0.0000291 lb/hr x 100 hr/yr) / 2,000 lb/ton] + [GEN 2] [(0.0000291 lb/hr x 100 hr/yr) / 2,000 lb/ton] + [GEN 3] [(0.0000372 lb/hr x 100 hr/yr) / 2,000 lb/ton]

APPENDIX C. RBLC DATABASE TABLES

**Appendix C - RBLC Search Results
New South Lumber Company - Bucks Mill**

Table C-1. RBLC Search Results for Continuous Wood Drying Kilns - VOC Assessment

State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Units	Control Method Description	Emission Limit 1 Limit	Emission Limit 1 Unit	Emission Limit 2 Limit	Emission Limit 2 Unit
AL	6/8/2017	11.4 MBF/HR CONTINUOUS DIRECT-FIRED LUMBER DRY KILN, 40 MMBTU/HR NATURAL GAS BURNER with 4 MMBTU/HR NATURAL GAS CONDENSATE EVAPORATOR	Natural Gas	11.4	MBF/hr	BACT DETERMINED AS PROPER KILN OPERATION AND MAINTENANCE PRACTICES	4	LB/MBF	--	
AL	8/30/2016	THREE CONTINUOUS DIRECT-FIRED LUMBER DRY KILNS, CDK-4/X023A, CDK-5/X023B, CDK-6/X023C	Wood-Sawdust	385	MMBF/YR	OPERATING AND MAINTENANCE PRACTICES	4.7	LB/MBF AS WPP1	--	
AL	5/26/2016	115,000 MBF/YR CDK D (ES-006) WITH 35 MMBTU/HR WOOD-FIRED AND 7 MMBTU/HR NG-FIRED BURNERS	Wood-Sawdust	115	MMBF/YR	OPERATING AND MAINTANCE PRACTICES	5.49	LB/MBF AS WPP1 VOC	--	
AL	5/26/2016	115,000 MBF/YR CDK E (ES-009) WITH 35 MMBTU/HR WOOD-FIRED AND 7 MMBTU/HR NG-FIRED BURNERS	Wood-Sawdust	115	MMBF/YR	MEASURE LUMBER MOISTURE CONTENT OPERATING AND MAINTENANCE PRACTICES LUMBER MOISTURE CONTENT MEASUREMENT	5.49	LB/MBF AS WPP1 VOC	--	
AL	8/5/2015	Continuous Direct-fired Lumber Dry Kiln with 34 MMBtu/hr Wood-fired burner	Biomass	16.4	MBF/hr	Good combustion practices and proper maintenance	4.21	LB/MBF	--	
AR	8/3/2015	LUMBER DRYING KILN SN-01	Natural Gas	45	MMBtu/Hr	PROPER MAINTENANCE AND OPERATION	3.8	LB/MBF	--	
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/HR	--	
AR	11/4/2024	Continuous Direct Fired Kilns	Natural Gas	45	MMBtu/hr	Proper Kiln Design and Operation	4.09	LB/MBF	--	
FL	7/14/2016	Direct-fired continuous lumber drying Kiln No. 5	Sawdust	110000	MBF/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	--	
FL	4/11/2017	Direct-Fired Batch Lumber Drying Kiln No. 5	Waste wood	50000	MMBF/YR	Minimization of over-drying	3.5	LB/MBF	--	
LA	10/4/2018	GRP0003 Lumber kilns (AK1)		300	MMBF/YR	properly design and operation	4.2	LB/MBF	300	MMBF/YR
LA	10/2/2019	Continuous Lumber Drying Kilns A and B (01-19 and 02-19)	Wood residuals	15.97	MBF/hr	Proper Kiln Design and Good Operating Practices	4.33	LB/MBF	--	
LA	4/12/2022	Lumber Drying Kilns (K-1, K-2, K-3, K-4)	Natural Gas	61.6	MBF/hr	Proper maintenance and Operation	3.8	LB/MBF	--	
LA	6/27/2023	Continuous Lumber Drying Kiln A, B, and C	Wood Residuals	30	MBF/hr	Good combustion practices, which include proper temperature and process management, drying to appropriate moisture content, and following the vendor recommended kiln maintenance schedule.	4.33	LB/MBF	--	
LA	10/31/2022	Lumber Drying Continuous Dry Kilns (EQT0002, EQT0003, EQT0004)	Natural Gas	45	MMbtu/hr (each)	Proper kiln maintenance and operation	4.38	LB/MBF	--	
SC	1/20/2015	LUMBER KILNS		194.83	MMBF/YR	PROPER MAINTENANCE AND OPERATION	225.6	T/YR	3.76	LB/MBF
SC	2/6/2018	Lumber Drying Kiln 7	Natural Gas	80	MMBF/YR	Volatile Organic Compounds (VOC) best available control technology for the continuous lumber drying kiln, KLN7, is work practice standards. VOC emissions are based on an emissions factor of 4.2 lb VOC/1000 bd-ft (as terpene + methanol + formaldehyde).	4.2	LB/MBF	--	
SC	9/6/2018	Lumber Drying Kiln 7	Sawdust	110	MMBF/YR	Volatile Organic Compounds (VOC) Best Available Control Technology (BACT) for the continuous lumber drying kiln, KLN7, is work practice standards. VOC emissions are based on an emission factor of 5.82 lb VOC/1000 bd-ft (as terpene + methanol + formaldehyde)	5.82	LB/MBF	--	
SC	9/24/2020	Kiln K3	Gasified Sawdust/Planner Shavings	58.2	MMBF/YR	Work Practice Standards	5.824	LB/MBF	--	
SC	9/24/2020	Kiln K7	Gasified Sawdust/Planner Shavings	80	MMBF/YR	Work Practice Standards	5.824	LB/MBF	--	
TX	6/15/2018	Kilns (EPNs CK01 and CK02)		25	MBF/KILN	Proper design and operation	3.38	LB/MBF	--	
TX	3/20/2019	Direct-Fired Wood Drying Kiln No. 3	wood	14.88	MBF	proper operation and maintenance of the kiln	4.24	LB/MBF	--	
TX	11/26/2019	Lumber Kilns		188000	MBF/KILN	Proper design and operating practices	5.49	LB/MBF	--	

**Appendix C - RBLC Search Results
New South Lumber Company - Bucks Mill**

Table C-2. RBLC Search Results for Internal Combustion Engines - VOC Assessment

State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Units	Control Method Description	Emission Limit 1		Emission Limit 2	
							Limit	Unit	Limit	Unit
IN	3/30/2023	Emergency Generator (CC-GEN2)	Diesel Fuel	500	HP	certified engine	1.13	G/HP-HR	--	
LA	8/31/2016	SCPS Emergency Diesel Firewater Pump 1	Diesel Fuel	282	HP	Good combustion practices	1.87	LB/H	0.47	TONS/YR
LA	5/2/2018	Emergency Diesel Engine Pump P-39A	Diesel Fuel	375	HP	Good combustion practices and NSPS Subpart IIII	4	G/KW-HR	--	
LA	5/2/2018	Emergency Diesel Engine Pump P-39B	Diesel Fuel	300	HP	Good combustion practices and NSPS Subpart IIII	4	G/KW-HR	--	
LA	5/4/2021	PVC Emergency Combustion Equipment 2A and 2B	Diesel Fuel	300	HP	Compliance with 40 CFR 60 Subpart IIII.	0.19	G/KW-HR	--	
LA	4/12/2022	Firewater Pump Engine (FIR)	Diesel Fuel	274	HP	Compliance with 40 CFR 60 Subpart IIII	0.02	TPY	--	
LA	5/10/2022	ENG1 - Emergency Fire Water Pump	Diesel Fuel	500	HP	Good combustion practices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitation for VOC.	1.85	LB/HR	0.08	TONS/YR
LA	6/3/2022	Emergency Diesel Fired Water Pump Engine	Diesel Fuel	355	HP	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and the use of ultra-low sulfur diesel fuel.	3	G/HP-HR	--	
LA	12/20/2023	FWP-01 - Firewater Pump Engine No. 1	Diesel Fuel	422	HP	Compliance with 40 CFR 60 Subpart IIII	1.47	LB/HR	--	
LA	12/20/2023	FWP-02 - Firewater Pump Engine No. 2	Diesel Fuel	422	HP	Compliance with 40 CFR 60 Subpart IIII	1.47	LB/HR	--	
LA	12/20/2023	FWP-03 - Firewater Pump Engine No. 3	Diesel Fuel	237	HP	Compliance with the requirements of 40 CFR 60 Subpart IIII	0.61	LB/HR	--	
LA	12/20/2023	EGEN2 - Admin Building Emergency Generator	Natural Gas	210	HP	Compliance with the requirements of 40 CFR 60 Subpart JJJJ	0.46	LB/HR	--	
LA	12/13/2023	HJK39 - Emergency Diesel Fire Pump Engine (EQT0094)	Diesel Fuel	200	HP	Compliance with 40 CFR 60 Subpart IIII	0.14	LB/H	0.01	TONS/YR
LA	12/16/2024	4U-11 - Substation Emergency Generator	Diesel Fuel	70	HP	Compliance with 40 CFR 60 Subpart IIII	0.14	LB/HR	0.01	TONS/YR
LA	12/16/2024	4M-11C - VCM Emergency Pump A	Diesel Fuel	200	HP	Compliance with 40 CFR 60 Subpart IIII	0.33	LB/HR	--	
LA	12/16/2024	4M-11D - VCM Emergency Pump B	Diesel Fuel	200	HP	Compliance with 40 CFR 60 Subpart IIII	0.33	LB/HR	--	
LA	12/16/2024	4M-11E - VCM Emergency Pump C	Diesel Fuel	200	HP	Compliance with 40 CFR 60 Subpart IIII	0.33	LB/HR	--	
NY	2/3/2016	Emergency fire pump	Diesel Fuel	460	HP	Compliance demonstrated with vendor emission certification and adherence to vendor-specified maintenance recommendations.	0.1	G/HP-HR	--	
OH	8/25/2015	Emergency fire pump engine (P004)	Diesel fuel	140	HP	State-of-the-art combustion design	0.11	LB/HR	0.03	TONS/YR
OH	9/23/2016	Emergency fire pump engine (P004)	Diesel fuel	311	HP	State-of-the-art combustion design	0.25	LB/HR	0.06	TONS/YR
OH	4/19/2017	Emergency Fire Pump Diesel Engine (P008)	Diesel fuel	460	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	0.14	LB/HR	0.007	TONS/YR
OH	9/7/2017	Emergency fire pump engine (P004)	Diesel fuel	300	HP	State-of-the-art combustion design	0.24	LB/HR	0.06	TONS/YR
OH	9/27/2017	Emergency fire pump engine (P004)	Diesel fuel	300	HP	State-of-the-art combustion design	0.24	LB/HR	0.06	TONS/YR
OH	10/23/2017	Emergency Fire Pump (P006)	Diesel fuel	410	HP	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturer's operating manual.	2.7	LB/HR	0.14	TONS/YR
OH	4/19/2018	Emergency Fire Pump (P004)	Diesel fuel	320	HP	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII	2.12	LB/HR	0.11	TONS/YR
OH	12/21/2018	Firewater Pumps (P005 and P006)	Diesel fuel	402	HP	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturer's operating manual	2.64	LB/HR	0.13	TONS/YR
OH	9/20/2022	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	Diesel fuel	275	HP	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices	0.7	LB/HR	0.2	TONS/YR
OK	1/8/2015	Diesel-Fueled Fire Pump Engines	Diesel Fuel	300	HP	1. Good Combustion Practices.	0.15	G/HP-HR	--	
TX	9/23/2018	FIRE PUMP DIESEL ENGINE	Diesel Fuel	214	kW	Meets EPA Tier 4 requirements	0.19	G/KW	--	
WI	9/1/2020	Emergency Diesel Fire Pump (P06)	Diesel Fuel	282	HP	Operation limited to 500 hours/year and operate and maintain according to the manufacturer's recommendations.	1.1	G/HP-HR	--	
WI	2/28/2020	Diesel-Fired Fire Pump Engine (P04)	Diesel Fuel	290	HP	Good combustion practices	0.26	LB/HR	--	
WI	9/19/2023	Fire Pump; S06/P06 : Emergency Diesel Fire Pump	Diesel Fuel	282	HP	Good combustion practices: (a) P06 may not operate more than 500 hours per each 12 rolling calendar months. (b) P06 shall be operated and maintained according to the manufacturer's recommendations. (c) VOC emission from P06 may not exceed 1.1 g/hp-hr.	1.1	G/HP-HR	500	HOURS

**Appendix C - RBL Search Results
New South Lumber Company - Bucks Mill**

Table C-3. RBL Search Results for Internal Combustion Engines - GHG Assessment

State	Permit Issuance Date	Process Name	Primary Fuel	Throughput	Units	Control Method Description	Emission Limit 1	
							Limit	Unit
IN	3/30/2023	Emergency Generator (CC-GEN2)	Diesel Fuel	500	HP	Good engineering design and manufacturer's recommended operating and maintenance procedures.	163.6	LB/MMBTU
LA	5/2/2018	Emergency Diesel Engine Pump P-39A	Diesel Fuel	375	HP	Good Combustion Practices	28	TONS/YEAR
LA	5/2/2018	Emergency Diesel Engine Pump P-39B	Diesel Fuel	300	HP	Good Combustion Practices	28	TONS/YEAR
LA	6/3/2022	Emergency Diesel Fired Water Pump Engine	Diesel Fuel	355	HP	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and the use of ultra-low sulfur diesel fuel.	74.21	KG/MM BTU
LA	12/13/2023	HLK39 - Emergency Diesel Fire Pump Engine (EQT0094)	Diesel Fuel	200	HP	Good Combustion Practices	12	TONS/YEAR
NY	2/3/2016	Emergency fire pump	Diesel Fuel	460	HP	Good combustion practice and efficient engine design.	115	TONS/YEAR
OH	8/25/2015	Emergency fire pump engine (P004)	Diesel Fuel	140	HP	Efficient design	41	TONS/YEAR
OH	9/23/2016	Emergency fire pump engine (P004)	Diesel Fuel	311	HP	Efficient design	90	TONS/YEAR
OH	4/19/2017	Emergency Fire Pump Diesel Engine (P008)	Diesel Fuel	460	HP	good combustion control and operating practices and engines designed to meet the stands of 40 CFR Part 60, Subpart IIII	123	TONS/YEAR
OH	9/7/2017	Emergency fire pump engine (P004)	Diesel Fuel	300	HP	Efficient design	87	TONS/YEAR
OH	9/27/2017	Emergency fire pump engine (P004)	Diesel Fuel	300	HP	State-of-the-art combustion design	87	TONS/YEAR
OH	10/23/2017	Emergency Fire Pump (P006)	Diesel Fuel	410	HP	good operating practices (proper maintenance and operation)	29	TONS/YEAR
OH	4/19/2018	Emergency Fire Pump (P004)	Diesel Fuel	320	HP	Efficient design and proper maintenance and operation	18.67	TONS/YEAR
OH	12/21/2018	Firewater Pumps (P005 and P006)	Diesel Fuel	402	HP	good operating practices (proper maintenance and operation)	23	TONS/YEAR
OH	9/20/2022	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	Diesel Fuel	275	HP	Good combustion practices and proper maintenance and operation	162.7	LB/MMBTU
OK	1/8/2015	Diesel-Fueled Fire Pump Engines	Diesel Fuel	300	HP	1. Good Combustion Practices. □ 2. Efficient Design.	44	TONS/YEAR
WI	9/19/2023	Fire Pump; S06/P06 :Emergency Diesel Fire Pump	Diesel Fuel	282	HP	Selection of the most efficient reciprocating internal combustion engine and minimizing the hours of operation limits greenhouse gas emissions. □ - EPA Tier 3 certified reciprocating internal combustion engine and □ - limiting its hours of operation to 500 hours per each 12 consecutive calendar months. □ - Part of ensuring efficient engine operation is properly maintaining the engine and the combustion of clean fuels. In this case, clean fuel is determined to be ultra-low sulfur diesel fuel (less than 15 ppm sulfur content).	500	HOURS

APPENDIX D. DETAILED BACT COST CONTROL CALCULATIONS

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-1. Emission Units Subject to BACT

Unit ¹	Max. Production Capacity
CDK1	92.5 MMBF/yr

1. CDK1 and CDK2 are identical, therefore CDK2 is also represented in these calculations.

Table D-2. Potential Control Scenario Summary

Emission Unit	Pollutant	Control Basis	Current Potential Emissions ¹	Capture Efficiency ²	Total Controlled Emissions Through the Stacks ³
CDK1	VOC	RTO	4.75 lb/MBF	80.0%	0.076 lb/MBF

1. VOC is converted from VOC as C to WPP1 VOC as follows:

$$VOC (WPP1) = [(VOC \text{ as } C) \times 1.225] + (1-0.65) \times \text{Methanol} + \text{Formaldehyde}$$

$$VOC (WPP1) = (3.8 \times 1.225) + (1-0.65) \times 0.16 + 0.04$$

NCASI Technical Bulletin No. 845. Table 8.1. May 2002. Wood Products Protocol 1 VOC from the EPA document, "Interim VOC Measurement Protocol for the Wood Products Industry – July 2007."

2. Per an ADEM recommendation an 80/20 split for emissions from vents versus fugitive. This is also consistent with recent applications submitted in AL (e.g., Rex Lumber).

3. Total Controlled Emissions Through Stack (lb/MBF) = Current Potential Emissions (lb/MBF) * Capture Efficiency * (1- Equivalent Reduction, 98%). Reduction efficiency based on EPA Air Pollution Control Cost Manual, Section 3.2, Chapter 2 Incinerators and Oxidizers (November 2017).

Table D-3. Cost Summary

Emission Unit	Pollutant	Technology	Control Efficiency ¹ (%)	Baseline Emissions (tpy)	Capture Efficiency ² (%)	Pollutant Removed (tpy)	Operating Cost (\$/ton removed)
CDK1	VOC	RTO	98%	219.7	80.0%	172.2	\$ 18,910

1. Control efficiency based on EPA Air Pollution Control Cost Manual, Section 3.2, Chapter 2 Incinerators and Oxidizers (November 2017).

2. Per an ADEM recommendation an 80/20 split for emissions from vents versus fugitive. This is also consistent with recent applications submitted in AL (e.g., Rex Lumber).

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-4. Cost Analysis Supporting Information for RTO

Parameter	CDK1	Units	Note(s)
Maximum Production Capacity	92.5	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	175.8	tpy	1
Removal Efficiency	98	%	2
VOC Removed	172.2	tpy	3
Control Equip. Outlet Temperature	1,450	° F	4
Airflow	32,000	acfm	5
Airflow Capture Efficiency	50	%	6
Exhaust Temperature	215	° F	5
Air Moisture Content	13.6	%	7
Exhaust Gas Flow Rate	35,667	scfm	8
Specific Heat of Dry Air	6.85	Btu/lb-mole·°F	9
Specific Heat of Water	17.99	Btu/lb-mole·°F	9
Pressure Drop	19	inches of H ₂ O	10
Fan Motor Efficiency	90	%	11
Fan Electricity Usage	39.5	kW-hr	12
Energy Required From Fuel	57.48	MMBtu/hr	13
Natural Gas Heat Capacity	1,020	MMBtu/MMscf	14
Operating Labor Cost	26.7	\$/hr	15
Maintenance Labor Cost	27.3	\$/hr	15
Electricity Cost	0.07	\$/kW-hr	15
Natural Gas Cost	3.8	\$/1,000 scf	15
RTO Equipment Life	20	years	16
Interest Rate	4.25	%	16
2002 \$ (Average)	179.9	n/a	17
2015 \$ (Average)	237.0	n/a	17
2025 \$ (August)	324.0	n/a	17

- Potential inlet emissions based on maximum capacity, potential emissions., and capture efficiency.
- Per OAQPS Manual, Section 3.2, Chapter 2, page 2-11 (November 2017).
- VOC Removed (tpy) = Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy).
- Based on average operating temperature (1,400 ° F - 1,500 ° F) in EPA Fact Sheet: <http://www.epa.gov/ttn/catc/dir1/fregen.pdf>
- Each kiln will have two stacks. Each stack has flow rate of 16,000 acfm.
- Engineering estimate based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhaeuser's Plymouth facility's continuous kiln construction application, which estimated a 50% capture efficiency for emissions from a continuous lumber kiln.
- Values based on stack test performed on Bibler Brothers Lumber Company continuous lumber kiln in Russellville, AR on March 12, 2009.
- Calculated based on fuel F-factor of 11,936 Btu/CF, and accounting for 18.86 percent oxygen based on information from Bibler Brothers Lumber Company March 12, 2009 stack test result and multiplied by the capture efficiency of 50%.
- Standard value.
- Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-50 (November 2017).
- Per OAQPS Manual, Section 3.2, Chapter 2, page 2-49, fan efficiencies vary from 40 to 80 percent(Green, 1999) while motor efficiencies are usually 90 percent. 90% is conservatively chosen. (November 2017).
- Per OAQPS Manual, Section 3.2, Chapter 2, Section 2.5.2.1 Page 2-49 (November 2017).
- Estimated as Exhaust Gas Flow Rate, scfm *60, min/hr * Density (Air), 0.0026 lb-mole/scf * Specific Heat (Btu/lb-mole·°F) * (Outlet Temp - Exhaust Temp, °F) / 10⁶, based on the sensible heat integral, $Q = m C_p (T_1 - T_2)$, where Q is the heat required, m is the mass flow rate of the air, C_p is the specific heat of air, T₁ is the outlet temperature of the RTO, and T₂ is the exhaust temperature from the equipment. Also incorporates energy required to heat water vapor.
- Average natural gas heating value per AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).
- Based on OAQPS, Section 2, Chapter 3, page 2-52 Table 2.12 (November 2017). Cost is expressed in 2015 value.
- Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-52 (November 2017).
- Values based on U.S. Historical Consumer Price Index: https://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_us_table.htm

Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill

Table D-5. Capital Cost Analysis for RTO for VOC Control

Capital Cost	CDK1	OAQPS Notation ¹
<i>Purchased Equipment Costs</i>		
Total Equipment Cost ²	2,248,078	A
Instrumentation	224,808	$0.10 \times A$
Sales Tax	67,442	$0.03 \times A$
Freight	112,404	$0.05 \times A$
<i>Total Purchased Equipment Costs</i>	<i>2,652,732</i>	<i>$B = 1.18 \times A$</i>
<i>Direct Installation Costs</i>		
Foundations and Supports	212,219	$0.08 \times B$
Handling and Erection	371,383	$0.14 \times B$
Electrical	106,109	$0.04 \times B$
Piping	53,055	$0.02 \times B$
Insulation	26,527	$0.01 \times B$
Painting	26,527	$0.01 \times B$
Site Preparation & Buildings	-	-
Additional duct work ³	-	-
<i>Total Direct Installation Costs</i>	<i>795,820</i>	<i>$C = 0.30 \times B$</i>
<i>Total Direct Costs</i>	<i>3,448,552</i>	<i>$DC = B+C$</i>
<i>Indirect Installation Costs</i>		
Engineering	265,273	$0.10 \times B$
Construction and Field Expense	132,637	$0.05 \times B$
Contractor Fees	265,273	$0.10 \times B$
Start-up	53,055	$0.02 \times B$
Performance Test	26,527	$0.01 \times B$
<i>Total Indirect Installation Costs</i>	<i>742,765</i>	<i>$IC = 0.31 \times B$</i>
Process Contingencies	419,132	$C = 0.1(DC+IC)$
Total Capital Investment (\$)	4,610,449	$TCI = DC+IC+C$

1. U.S. EPA OAQPS Manual, Section 3.2, Chapter 2, pages 2-47 to 2-49, Tables 2.10 and 2.11 (November 2017).

2. Capital Costs are based the EPA CATC Regenerative Incinerator Fact Sheet (EPA-452/F-03-021) average \$/scfm capital cost, scaled from 2002 \$ to 2025 \$.

Minimum regenerative thermal oxidizer cost	35	2002 dollars/scfm
Conversion from 2002 to August 2025 dollars	1.80	August dollars per 2002 dollar
Minimum regenerative incinerator cost	63.03	August 2025 dollars/scfm

3. Additional duct work will be required to round two stacks on each kiln into on single RTO. However, for conservatism, no cost has been included for additional duct work.

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-6. Operating Cost Analysis for RTO for VOC control

Operating Cost	CDK1	OAQPS Notation¹
<i>Direct Annual Costs</i>		
Operating Labor (0.5 hr, per 8-hr shift) ³	19,982	E
Supervisory Labor	2,997	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	20,393	G
Maintenance Materials	20,393	H = G
Electricity ³	32,604	I
Natural Gas ³	2,591,219	J
<i>Total Direct Annual Costs</i>	<i>2,687,589</i>	<i>DAC = E + F + G + H + I + J</i>
<i>Indirect Annual Costs</i>		
Overhead	38,259	K = 0.60 × (E + F + G + H)
Administrative Charges	92,209	L = 0.02 × TCI
Property Tax	46,104	M = 0.01 × TCI
Insurance	46,104	N = 0.01 × TCI
Capital Recovery ²	346,706	CFR*TCI
<i>Total Indirect Annual Costs</i>	<i>569,383</i>	<i>IDAC = K + L + M + N + O</i>
Total Annual Cost (\$)	3,256,971	<i>TAC = DAC + IDAC</i>
Pollutant Removed (tpy)	172.2	
Cost per ton of Pollutant Removed (\$)	18,910	<i>\$/ton = TAC / Pollutant Removed</i>

1. U.S. EPA OAQPS Manual, Section 3.2, Chapter 2, page 2-52, Tables 2.12 (November 2017).

2. The capital recovery cost factor, CRF, is a function of the equipment life (typically, 20 years) and the opportunity cost of the capital (i.e., interest rate). For a 20-year equipment life and a 4.25% interest rate, CRF = 0.0752.

3. Direct annual cost based on 2015 dollar.

Conversion from 2015 to August 2025 dollars 1.37 August 2025 dollars per 2015 dollar

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-7. Emission Units Subject to BACT

Unit ¹	Max. Production Capacity
CDK3	100.0 MMBF/yr

1. CDK3 and CDK4 are identical, therefore CDK4 is also represented in these calculations.

Table D-8. Potential Control Scenario Summary

Emission Unit	Pollutant	Control Basis	Current Potential Emissions ¹	Capture Efficiency ²	Total Controlled Emissions Through the Stacks ³
CDK3	VOC	RTO	4.75 lb/MBF	80.0%	0.076 lb/MBF

1. VOC is converted from VOC as C to WPP1 VOC as follows:

$$VOC (WPP1) = [(VOC \text{ as } C) \times 1.225] + (1-0.65) \times \text{Methanol} + \text{Formaldehyde}$$

$$VOC (WPP1) = (3.8 \times 1.225) + (1-0.65) \times 0.16 + 0.04$$

NCASI Technical Bulletin No. 845. Table 8.1. May 2002. Wood Products Protocol 1 VOC from the EPA document, "Interim VOC Measurement Protocol for the Wood Products Industry – July 2007."

2. Per an ADEM recommendation an 80/20 split for emissions from vents versus fugitive. This is also consistent with recent applications submitted in AL (e.g., Rex Lumber).

3. Total Controlled Emissions Through Stack (lb/MBF) = Current Potential Emissions (lb/MBF) * Capture Efficiency * (1- Equivalent Reduction, 98%). Reduction efficiency based on EPA Air Pollution Control Cost Manual, Section 3.2, Chapter 2 Incinerators and Oxidizers (November 2017).

Table D-9. Cost Summary

Emission Unit	Pollutant	Technology	Control Efficiency ¹ (%)	Baseline Emissions (tpy)	Capture Efficiency ² (%)	Pollutant Removed (tpy)	Operating Cost (\$/ton removed)
CDK3	VOC	RTO	98%	237.5	80.0%	186.2	\$ 17,492

1. Control efficiency based on EPA Air Pollution Control Cost Manual, Section 3.2, Chapter 2 Incinerators and Oxidizers (November 2017).

2. Per an ADEM recommendation an 80/20 split for emissions from vents versus fugitive. This is also consistent with recent applications submitted in AL (e.g., Rex Lumber).

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-10. Cost Analysis Supporting Information for RTO

Parameter	CDK3	Units	Note(s)
Maximum Production Capacity	100	MMBF/yr	
Uncontrolled Stack Inlet Emissions (VOC)	190.0	tpy	1
Removal Efficiency	98	%	2
VOC Removed	186.2	tpy	3
Control Equip. Outlet Temperature	1,450	° F	4
Airflow	32,000	acfm	5
Airflow Capture Efficiency	50	%	6
Exhaust Temperature	215	° F	5
Air Moisture Content	13.6	%	7
Exhaust Gas Flow Rate	35,667	scfm	8
Specific Heat of Dry Air	6.85	Btu/lb-mole·°F	9
Specific Heat of Water	17.99	Btu/lb-mole·°F	9
Pressure Drop	19	inches of H ₂ O	10
Fan Motor Efficiency	90	%	11
Fan Electricity Usage	39.5	kW-hr	12
Energy Required From Fuel	57.48	MMBtu/hr	13
Natural Gas Heat Capacity	1,020	MMBtu/MMscf	14
Operating Labor Cost	26.7	\$/hr	15
Maintenance Labor Cost	27.3	\$/hr	15
Electricity Cost	0.07	\$/kW-hr	15
Natural Gas Cost	3.8	\$/1,000 scf	15
RTO Equipment Life	20	years	16
Interest Rate	4.25	%	16
2002 \$ (Average)	179.9	n/a	17
2015 \$ (Average)	237.0	n/a	17
2025 \$ (August)	324.0	n/a	17

- Potential inlet emissions based on maximum capacity, potential emissions., and capture efficiency.
- Per OAQPS Manual, Section 3.2, Chapter 2, page 2-11 (November 2017).
- VOC Removed (tpy) = Removal Efficiency (%) × Uncontrolled Stack Inlet Emissions (tpy).
- Based on average operating temperature (1,400 ° F - 1,500 ° F) in EPA Fact Sheet: <http://www.epa.gov/ttn/catc/dir1/fregen.pdf>
- Each kiln will have two stacks. Each stack has flow rate of 16,000 acfm.
- Engineering estimate based on North Carolina Department of Environment and Natural Resources Air Permit Review for Weyerhaeuser's Plymouth facility's continuous kiln construction application, which estimated a 50% capture efficiency for emissions from a continuous lumber kiln.
- Values based on stack test performed on Bibler Brothers Lumber Company continuous lumber kiln in Russellville, AR on March 12, 2009.
- Calculated based on fuel F-factor of 11,936 Btu/CF, and accounting for 18.86 percent oxygen based on information from Bibler Brothers Lumber Company March 12, 2009 stack test result and multiplied by the capture efficiency of 50%.
- Standard value.
- Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-50 (November 2017).
- Per OAQPS Manual, Section 3.2, Chapter 2, page 2-49, fan efficiencies vary from 40 to 80 percent(Green, 1999) while motor efficiencies are usually 90 percent. 90% is conservatively chosen. (November 2017).
- Per OAQPS Manual, Section 3.2, Chapter 2, Section 2.5.2.1 Page 2-49 (November 2017).
- Estimated as Exhaust Gas Flow Rate, scfm *60, min/hr * Density (Air), 0.0026 lb-mole/scf * Specific Heat (Btu/lb-mole·°F) * (Outlet Temp - Exhaust Temp, °F) / 10⁶, based on the sensible heat integral, $Q = m C_p (T_1 - T_2)$, where Q is the heat required, m is the mass flow rate of the air, C_p is the specific heat of air, T₁ is the outlet temperature of the RTO, and T₂ is the exhaust temperature from the equipment. Also incorporates energy required to heat water vapor.
- Average natural gas heating value per AP-42 Section 1.4 *Natural Gas Combustion* (July 1998).
- Based on OAQPS, Section 2, Chapter 3, page 2-52 Table 2.12 (November 2017). Cost is expressed in 2015 value.
- Based on example problem in OAQPS Manual, Section 3.2, Chapter 2, page 2-52 (November 2017).
- Values based on U.S. Historical Consumer Price Index: https://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_us_table.htm

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-11. Capital Cost Analysis for RTO for VOC Control

Capital Cost	CDK3	OAQPS Notation¹
<i>Purchased Equipment Costs</i>		
Total Equipment Cost ²	2,248,078	A
Instrumentation	224,808	0.10 × A
Sales Tax	67,442	0.03 × A
Freight	112,404	0.05 × A
<i>Total Purchased Equipment Costs</i>	<i>2,652,732</i>	<i>B = 1.18 × A</i>
<i>Direct Installation Costs</i>		
Foundations and Supports	212,219	0.08 × B
Handling and Erection	371,383	0.14 × B
Electrical	106,109	0.04 × B
Piping	53,055	0.02 × B
Insulation	26,527	0.01 × B
Painting	26,527	0.01 × B
Site Preparation & Buildings	-	-
Additional duct work ³	-	-
<i>Total Direct Installation Costs</i>	<i>795,820</i>	<i>C = 0.30 × B</i>
<i>Total Direct Costs</i>	<i>3,448,552</i>	<i>DC = B+C</i>
<i>Indirect Installation Costs</i>		
Engineering	265,273	0.10 × B
Construction and Field Expense	132,637	0.05 × B
Contractor Fees	265,273	0.10 × B
Start-up	53,055	0.02 × B
Performance Test	26,527	0.01 × B
<i>Total Indirect Installation Costs</i>	<i>742,765</i>	<i>IC = 0.31 × B</i>
Process Contingencies	419,132	C = 0.1(DC+IC)
Total Capital Investment (\$)	4,610,449	TCI = DC+IC+C

1. U.S. EPA OAQPS Manual, Section 3.2, Chapter 2, pages 2-47 to 2-49, Tables 2.10 and 2.11 (November 2017).

2. Capital Costs are based the EPA CATC Regenerative Incinerator Fact Sheet (EPA-452/F-03-021) average \$/scfm capital cost, scaled from 2002 \$ to 2025 \$.

Minimum regenerative thermal oxidizer cost	35	2002 dollars/scfm
Conversion from 2002 to August 2025 dollars	1.80	August 2025 dollars per 2002 dollar
Minimum regenerative incinerator cost	63.03	August 2025 dollars/scfm

3. Additional duct work will be required to round two stacks on each kiln into on single RTO. However, for conservatism, it is assumed that no cost for additional duct work.

**Appendix D - BACT Calculations
New South Lumber Company - Bucks Sawmill**

Table D-12. Operating Cost Analysis for RTO for VOC control

Operating Cost	CDK3	OAQPS Notation ¹
<i>Direct Annual Costs</i>		
Operating Labor (0.5 hr, per 8-hr shift) ³	19,982	E
Supervisory Labor	2,997	F = 0.15 × E
Maintenance Labor (0.5 hr, per 8-hr shift)	20,393	G
Maintenance Materials	20,393	H = G
Electricity ³	32,604	I
Natural Gas ³	2,591,219	J
<i>Total Direct Annual Costs</i>	<i>2,687,589</i>	<i>DAC = E + F + G + H + I + J</i>
<i>Indirect Annual Costs</i>		
Overhead	38,259	K = 0.60 × (E + F + G + H)
Administrative Charges	92,209	L = 0.02 × TCI
Property Tax	46,104	M = 0.01 × TCI
Insurance	46,104	N = 0.01 × TCI
Capital Recovery ²	346,706	CFR*TCI
<i>Total Indirect Annual Costs</i>	<i>569,383</i>	<i>IDAC = K + L + M + N + O</i>
Total Annual Cost (\$)	3,256,971	<i>TAC = DAC + IDAC</i>
Pollutant Removed (tpy)	186.2	
Cost per ton of Pollutant Removed (\$)	17,492	<i>\$/ton = TAC / Pollutant Removed</i>

1. U.S. EPA OAQPS Manual, Section 3.2, Chapter 2, page 2-52, Tables 2.12 (November 2017).

2. The capital recovery cost factor, CRF, is a function of the equipment life (typically, 20 years) and the opportunity cost of the capital (i.e., interest rate). For a 20-year equipment life and a 4.25% interest rate, CRF = 0.0752.

3. Direct annual cost based on 2015 dollar.

Conversion from 2015 to August 2025 dollars 1.37 August 2025 dollars per 2015 dollar

APPENDIX E. ADEM APPLICATION FORMS

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**



**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION FORM 103**

Do not Write in This Space

Facility Number

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CONSTRUCTION/OPERATING PERMIT APPLICATION FACILITY IDENTIFICATION FORM	
1.	Name of Facility or Organization: <u>New South Lumber Company</u>
	Plant Name <u>Bucks Sawmill</u>
	Facility Physical Location Address
	Street & Number: <u>14083 U.S. Highway 43</u>
	City: <u>Bucks</u> County: <u>Mobile</u> Zip: <u>36512</u>
	Facility Mailing Address (If different from above)
	Mailing Contact: <u>David Crawford Jr.</u>
	Address or PO Box: <u>101 Dauphin Street, Suite 600</u>
	City: <u>Mobile</u> State: <u>AL</u> Zip: <u>36602</u>
	Facility Billing Address
2.	Billing Contact: <u>David Crawford Jr.</u>
	Street & Number: <u>101 Dauphin Street, Suite 600</u>
	City: <u>Mobile</u> State: <u>AL</u> Zip: <u>36601</u>
	Telephone Number: <u>251-295-8307</u> E-mail Address: <u>david.crawfordjr@canfor.com</u>
	Responsible Official's Business Mailing Address
3.	Responsible Official: <u>Tyrel Vice</u> Title: <u>Plant Manager</u>
	Street & Number: <u>14083 U.S. Highway 43</u>
	City: <u>Bucks</u> State: <u>AL</u> Zip: <u>36512</u>
	Telephone Number: <u>251-457-6872</u> E-mail Address: <u>david.vice@canfor.com</u>
	RO under delegated authority? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (if "yes", provide appropriate documentation)
	Plant Contact Information
4.	Plant Contact: <u>Chelsea Fisher</u> Title: <u>Environmental Manager Southeast Operations</u>
	Telephone Number: <u>251-459-8768</u> E-mail Address: <u>chelsea.fisher@canfor.com</u>

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

5. Location Coordinates:				
UTM:	402,124.010	E-W	3,431,410.570	N-S
Latitude/Longitude:	31.01225	LAT	-88.02535	LONG

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

- Air permit
- Major source operating permit
- Synthetic minor source operating permit

7. Permit application is made for:

- Existing source (initial application)
- Existing source (permit renewal)
- Modification
- New source (to be constructed)
- Change of ownership
- Other (specify) _____

Date construction/modification to begin: May-26 to be completed: _____

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 provided). Multiple forms may be used as required.

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

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)):

SIC 2421 - NAICS 321113

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

10. Summarize each pollutant emitted and the potential facility-wide annual emission rate for the pollutant. Indicate those pollutants for which the facility is major.

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
Filterable PM	15.63	<input type="radio"/> Yes <input checked="" type="radio"/> No
Total PM10	11.44	<input type="radio"/> Yes <input checked="" type="radio"/> No
Total PM2.5	9.96	<input type="radio"/> Yes <input checked="" type="radio"/> No
Condensable PM	5.85	<input type="radio"/> Yes <input checked="" type="radio"/> No
NOX	36.28	<input type="radio"/> Yes <input checked="" type="radio"/> No
CO	65.89	<input type="radio"/> Yes <input checked="" type="radio"/> No
VOC	734.46	<input checked="" type="radio"/> Yes <input type="radio"/> No
SO2	7.23	<input type="radio"/> Yes <input checked="" type="radio"/> No
Lead	1.37E-02	<input type="radio"/> Yes <input checked="" type="radio"/> No
Total HAP	47.5	<input checked="" type="radio"/> Yes <input type="radio"/> No
Max. Single HAP	26.2	<input checked="" type="radio"/> Yes <input type="radio"/> No
Greenhouse Gases (CO ₂ e, includes fugitive emissions)	119,839	<input checked="" type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No
		<input type="radio"/> Yes <input type="radio"/> No

*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. Provide a scaled map which contains clearly marked emission points, building locations, property boundaries, and directions (North, etc.). Labeling of emission points should be consistent across all forms.

New South Lumber Company - Bucks Sawmill

Appendix E - ADEM Application Forms

12. 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: CDK-1 and CDK-2

(description)

Emission Point No.	Pollutant ⁴	Standard	Program ¹	Method used to determine compliance	Compliance Status	
					IN ²	OUT ³
CDK1, CDK2	Filterable PM	24.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	Total PM ₁₀	14.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	Total PM _{2.5}	9.96 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	PM	Opacity <20%, 40%	SIP	40 CFR Part 60, App. A, Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	VOC	4.75 lb/MBF	PSD BACT	WPP1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	CO ₂ e	36,827 TPY	PSD BACT	40 CFR Part 98, Subpart A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

¹PSD, 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)

²Attach compliance plan

³Attach compliance schedule (ADEM Form-437)

⁴Fugitive emissions must be included as separate entries

New South Lumber Company - Bucks Sawmill

Appendix E - ADEM Application Forms

12. 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: CDK-3 and CDK-4

(description)

Emission Point No.	Pollutant ⁴	Standard	Program ¹	Method used to determine compliance	Compliance Status	
					IN ²	OUT ³
CDK3, CDK4	Filterable PM	24.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK3, CDK4	Total PM ₁₀	14.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK3, CDK4	Total PM _{2.5}	9.96 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK3, CDK4	PM	Opacity <20%, 40%	SIP	40 CFR Part 60, App. A, Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK3, CDK4	VOC	4.75 lb/MBF	PSD BACT	WPP1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK3, CDK4	CO ₂ e	23,080 TPY	PSD BACT	40 CFR Part 98, Subpart A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

¹PSD, 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)

²Attach compliance plan

³Attach compliance schedule (ADEM Form-437)

⁴Fugitive emissions must be included as separate entries

New South Lumber Company - Bucks Sawmill

Appendix E - ADEM Application Forms

12. 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: CDK-1 and CDK-2 Abort Stack (Startup Operations)
 (description)

Emission Point No.	Pollutant ⁴	Standard	Program ¹	Method used to determine compliance	Compliance Status	
					IN ²	OUT ³
CDK1, CDK2	Filterable PM	24.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	Total PM ₁₀	14.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	Total PM _{2.5}	9.96 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	PM	Opacity <20%, 40%	SIP	40 CFR Part 60, App. A, Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CDK1, CDK2	VOC	0.016 tpy	PSD BACT	AP-42 Sec. 1.6; Recordkeeping	<input checked="" type="checkbox"/>	<input type="checkbox"/>
All Kilns*	All	Operation Log	PSD BACT	Recordkeeping for period of usage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
* Abort Stacks are not used by the gas-fired kilns during startup. New South will maintain records of abort stack usage for all kilns regardless of reason.					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

¹PSD, 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)

²Attach compliance plan

³Attach compliance schedule (ADEM Form-437)

⁴Fugitive emissions must be included as separate entries

New South Lumber Company - Bucks Sawmill

Appendix E - ADEM Application Forms

12. 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: SC-1 & SC-2 - Cyclones for Fuel Silos, DC-1 - Cyclone and Baghouse for Planer Mill

(description)

Emission Point No.	Pollutant ⁴	Standard	Program ¹	Method used to determine compliance	Compliance Status	
					IN ²	OUT ³
SC01, SC02	Filterable PM	24.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SC01, SC02	Total PM ₁₀	14.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SC01, SC02	Total PM _{2.5}	9.96 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
SC01, SC02	PM	Opacity <20%, 40%	SIP	40 CFR Part 60, App. A, Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
PLN1-DC1	PM	Opacity <20%, 40%	SIP	40 CFR Part 60, App. A, Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PLN1-DC1	Filterable PM	24.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PLN1-DC1	Total PM ₁₀	14.9 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
PLN1-DC1	Total PM _{2.5}	9.96 TPY	PSD SMS (facility-wide)	40 CFR Part 60, App. A, Method 5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

¹PSD, 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)

²Attach compliance plan

³Attach compliance schedule (ADEM Form-437)

⁴Fugitive emissions must be included as separate entries

New South Lumber Company - Bucks Sawmill

Appendix E - ADEM Application Forms

12. 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: Emergency Generators (GEN1, GEN2, GEN3) & Emergency Fire Pump Engine (ENG1)

(description)

Emission Point No.	Pollutant ⁴	Standard	Program ¹	Method used to determine compliance	Compliance Status	
					IN ²	OUT ³
GEN 1,2,3	PM	7.71xE-05 lb/MMBtu	AP-42	40 CFR Part 60, App. A Method 9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GEN 1,2,3 ENG1	All	100 operating hours	NSPS IIII/JJJJ	Non-resettable hour meter; Operation log	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GEN 1,2,3	NOx	10 g/HP-hr	NSPS JJJJ	Certified Engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GEN 1,2,3	CO	387 g/HP-hr	NSPS JJJJ	Certified Engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ENG1	NMHC + NOx	4.0 g/kW-hr	NSPS IIII	Certified Engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ENG1	PM	0.2 g/kW-hr	NSPS IIII	Certified Engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ENG1	CO	3.5 g/kW-hr	NSPS IIII	Certified Engine	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ENG1	CO ₂ e	17.6 TPY	PSD BACT	40 CFR Part 98, Subpart A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GEN1, 2	CO ₂ e	2.08 TPY	PSD BACT	40 CFR Part 98, Subpart A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GEN3	CO ₂ e	2.66 TPY	PSD BACT	40 CFR Part 98, Subpart A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>

¹PSD, 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)

²Attach compliance plan

³Attach compliance schedule (ADEM Form-437)

⁴Fugitive emissions must be included as separate entries

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

14. List and explain any facility-wide exemptions from applicable requirements the facility is claiming:

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____
- i. _____

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

- a. Application Narrative
- b. Appendix A - Site Map and Process Diagram
- c. Appendix B - Emissions Calculations
- d. Appendix C - RBLC Tables
- e. Appendix D - BACT cost control calculations
- f. Appendix E - ADEM Forms
- g. Appendix F - Ozone MERPS assessment
- h. Appendix G - Proposed permit conditions and monitoring
- i. Appendix H - Cited Materials
- j. Appendix I - Operation & Maintenance Plans for Kilns

Name of person preparing application: Rachael Broadway

Company of preparer: Trinity Consultants

Phone 205-973-0659 Email: rachael.broadway@trinityconsultants.com

Signature:  Date: 3/12/2026

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

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.

 Plant Manager 3/16/2026
SIGNATURE OF RESPONSIBLE OFFICIAL TITLE DATE

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

				-						-				
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1. Name of facility or organization: New South Lumber Company - Bucks 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: _____

Packs of lumber from the sawmill area will be stacked onto carts, which will then be pushed on rail tracks into one of the two biomass kilns. In the lumber drying area, packs of green lumber will be heated to dry the lumber to a moisture content between 15-20%. The facility will operate two, direct-fired biomass continuous kilns (CDK1, CDK2). The biomass kilns will each have a 40 MMBtu burner and a maximum capacity of 92.5 million board feet (MMBF) annually. Emissions from the kilns will be directed through powered stacks at the end of each kiln.

Normal operations of kilns require periodic startup and shutdown for maintenance checks. During periods of startup of the biomass kilns, the abort stack will vent directly into the atmosphere. Diesel fuel and biomass will be used to ignite the burner of each biomass burner. Abort stack usage for all kilns will be monitored and recorded by New South.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Two Biomass Kilns

Source Classification Code(s): 30700606

Equipment manufacturer's information

Make: Deltech / Comact Model: Various

Rated process capacity (manufacturer's or designer's guaranteed maximum): 92.5 MMBF/yr (each)

Manufactured date: 2023

Proposed installation date: _____

Original installation date (if existing): 2024

Reconstruction/Modification date (if applicable): N/A

4. Normal schedule of operation:

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

Peak production season (if any): N/A

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

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
Green Lumber	10.6 MBF/hr	10.6 MBF/hr	92.5 MMBF/yr per kiln

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM form 104): 40 MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max % Sulfur	Max % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal				
Natural Gas	N/A	Btu/ft ³				
L. P. Gas	N/A	Btu/ft ³				
Wood	4,500	Btu/lb	N/A	N/A	N/A	N/A
Other	N/A					

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						

7. Products of process or unit:

Products	Quantity/year	Units of production
Dry Lumber	92,500,000	BF/yr per kiln

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions

Biomass kilns limited to 92.5 MMBF/yr per kiln

VOC BACT - Proper maintenance and operation. VOC emissions rate at 4.75 lb/MBF VOC as WPP1

12-month rolling average moisture content of dried lumber greater than or equal to 13%

CO₂e BACT - 12-month rolling total emissions limited to 36,827 tpy per kiln

9. Are you requesting a limitation for permitting? Yes No if "yes", specify the limit and affected unit(s):

PM PSD SMS facility-wide limits as follows:

Filterable PM = 24.9 tpy; Total PM10 = 14.9 tpy; Total PM2.5 = 9.96 tpy

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

Yes No (if "yes", ADEM Form 110 must be completed and attached)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

11. 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	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (feet)	GEP Stack Height (feet)	Base Elevation (feet)	Inside Diameter for Round Opening (feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp (°F)
			E-W (km)	N-S (km)	LAT	LONG								
CDK-1 STK1	Vertical Stack	<input type="checkbox"/>	401592	3428328			35	50	43	2.83	N/A	42.3	16000	215
CDK-1 STK2	Vertical Stack	<input type="checkbox"/>	401653	3428328			35	50	43	2.83	N/A	42.3	16000	215
CDK-2 STK1	Vertical Stack	<input type="checkbox"/>	401594	3428290			35	50	43	2.83	N/A	42.3	16000	215
CDK-2 STK1	Vertical Stack	<input type="checkbox"/>	401655	3428290			35	50	43	2.83	N/A	42.3	16000	215
CDK-1 AS1	Vertical Stack	<input type="checkbox"/>	401620	3428313			36.3	50	43	2.69	N/A	58.76	20000	150
CDK-2 AS1	Vertical Stack	<input type="checkbox"/>	401623	3428294			36.3	50	43	2.69	N/A	58.76	20000	150
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												

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

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CDK1 (Point Emissions)	<input type="checkbox"/>	Filterable PM	0.600	2.627			Scotch Gulf Lumber MSOP	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.879	3.848			Scotch Gulf Lumber MSOP	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}	0.836	3.663			Scotch Gulf Lumber MSOP	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.583	2.553			GA EPD Recommended EF	
	<input type="checkbox"/>	NO _x	2.33	10.21			Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	CO	3.67	16.06			Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	VOC	40.13	175.75			WPP1	4.75 lb/MBF
	<input type="checkbox"/>	SO ₂	0.80	3.50			AP-42 Sec. 1.5	
	<input type="checkbox"/>	Methanol	1.52	6.66			Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	HAP	2.80	12.25			Scotch Gulf Lumber MSOP	
CDK1 (Fugitive Emissions)	<input checked="" type="checkbox"/>	Filterable PM	0.15	0.657			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.22	0.962			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.21	0.916			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Condensable PM	0.15	0.638			GA EPD Recommended EF	
	<input checked="" type="checkbox"/>	NO _x	0.58	2.55			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	CO	0.92	4.01			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	VOC	10.03	43.94			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	SO ₂	0.20	0.88			AP-42 Sec. 1.5	
	<input checked="" type="checkbox"/>	Methanol	0.38	1.67			Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	HAP	0.70	3.06			Scotch Gulf Lumber MSOP	
CDK1 (Abort Stack Emissions)	<input type="checkbox"/>	Filterable PM	0.43	0.010			AP-42 Sec. 1.3	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.59	0.014			AP-42 Sec. 1.3	14.9 TPY (Facility-Wide)

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

	<input type="checkbox"/>	Total PM _{2.5}	0.55	0.013		AP-42 Sec. 1.3	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.45	0.011		AP-42 Sec. 1.3	
	<input type="checkbox"/>	NO _x	2.19	0.05		AP-42 Sec. 1.3	
	<input type="checkbox"/>	CO	3.44	0.08		AP-42 Sec. 1.3	
	<input type="checkbox"/>	VOC	0.68	0.02		AP-42 Sec. 1.6	0.016 tpy
	<input type="checkbox"/>	SO ₂	0.75	0.02		AP-42 Sec. 1.3	
	<input type="checkbox"/>	Methanol	2.19E-05	5.26E-07		AP-42 Sec. 1.3	
	<input type="checkbox"/>	HAP	7.22E-05	1.73E-06		AP-42 Sec. 1.3	
CDK2 (Point Source)	<input type="checkbox"/>	Filterable PM	0.600	2.627		Scotch Gulf Lumber MSOP	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.879	3.848		Scotch Gulf Lumber MSOP	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}	0.836	3.663		Scotch Gulf Lumber MSOP	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.583	2.553		GA EPD Recommended EF	
	<input type="checkbox"/>	NO _x	2.33	10.21		Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	CO	3.67	16.06		Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	VOC	40.13	175.75		WPP1	4.75 lb/MBF
	<input type="checkbox"/>	SO ₂	0.80	3.50		AP-42 Sec. 1.5	
	<input type="checkbox"/>	Methanol	1.52	6.66		Scotch Gulf Lumber MSOP	
	<input type="checkbox"/>	HAP	0.70	3.06		Scotch Gulf Lumber MSOP	
CDK2 (Fugitive Emissions)	<input checked="" type="checkbox"/>	Filterable PM	0.15	0.66		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.22	0.96		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.21	0.92		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Condensable PM	0.15	0.64		GA EPD Recommended EF	
	<input checked="" type="checkbox"/>	NO _x	0.58	2.55		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	CO	0.92	4.01		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	VOC	10.03	43.94		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	SO ₂	0.20	0.88		Scotch Gulf Lumber MSOP	
	<input checked="" type="checkbox"/>	Methanol	0.38	1.67		Scotch Gulf Lumber MSOP	

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

	<input checked="" type="checkbox"/>	HAP	0.70	3.06			Scotch Gulf Lumber MSOP	
CDK2 (Abort Stack Emissions)	<input type="checkbox"/>	Filterable PM	0.43	0.010			AP-42 Sec. 1.3	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.59	0.014			AP-42 Sec. 1.3	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}	0.55	0.013			AP-42 Sec. 1.3	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.45	0.011			AP-42 Sec. 1.3	
	<input type="checkbox"/>	NO _x	2.19	0.05			AP-42 Sec. 1.3	
	<input type="checkbox"/>	CO	3.44	0.08			AP-42 Sec. 1.3	
	<input type="checkbox"/>	VOC	0.68	0.02			AP-42 Sec. 1.6	0.016 tpy
	<input type="checkbox"/>	SO ₂	0.75	0.02			AP-42 Sec. 1.3	
	<input type="checkbox"/>	Methanol	2.19E-05	5.26E-07			AP-42 Sec. 1.3	
	<input type="checkbox"/>	HAP	7.22E-05	1.73E-06			AP-42 Sec. 1.3	

13. On a separate sheet, provide a flow diagram to:
- (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.

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

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

Yes No

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

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

Yes No

16. 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.)
N/A			

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/12/2026

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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- Name of facility or organization: New South Lumber Company - Bucks Sawmill
- 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: _____

Packs of lumber from the sawmill area will be stacked onto carts, which will then be pushed on rail tracks into one of the two natural gas kilns. In the lumber drying area, packs of green lumber will be heated to dry the lumber to a moisture content between 15-20%. The facility will operate two, direct-fired natural gas continuous kilns (CDK3, CDK4). The natural gas kilns will each have a 45 MMBtu burner and a maximum capacity of 100 million board feet (MMBF) annually. Emissions from the kilns will be directed through powered stacks at the end of each kiln.

- Type of unit or process (e.g., calcining kiln, cupola furnace): Two Natural Gas Kilns

Source Classification Code(s): 30700611

Equipment manufacturer's information

Make: Deltech Model: Various

Rated process capacity (manufacturer's or designer's guaranteed maximum): 100 MMBF/yr (each)

Manufactured date: 2023

Proposed installation date: 2026 (CDK4)

Original installation date (if existing): 2024 (CDK3)

Reconstruction/Modification date (if applicable): N/A

- Normal schedule of operation:

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

Peak production season (if any): N/A

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

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
Green Lumber	11.42 MBF/hr	11.42 MBF/hr	100 MMBF/yr per kiln

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM form 104): 45 MMBtu/hr

Primary:

Fuel	Heat Content	Units	Max % Sulfur	Max % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal	N/A	Btu/lb				
Fuel Oil	N/A	Btu/gal	N/A	N/A	N/A	N/A
Natural Gas	1,020	Btu/ft ³				
L. P. Gas	N/A	Btu/ft ³				
Wood	N/A	Btu/lb				
Other	N/A					

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						

7. Products of process or unit:

Products	Quantity/year	Units of production
Dry Lumber	100,000,000	BF/yr per kiln

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions

Natural Gas kilns limited to 100 MMBF/yr per kiln

VOC BACT - Proper maintenance and operation. VOC emissions rate at 4.75 lb/MBF VOC as WPP1

12-month rolling average moisture content of dried lumber greater than or equal to 13%

CO₂e BACT - 12-month rolling total emissions limited to 23,080 tpy per kiln

9. Are you requesting a limitation for permitting? Yes No if "yes", specify the limit and affected unit(s):

PM PSD SMS facility-wide limits as follows:

Filterable PM = 24.9 tpy; Total PM10 = 14.9 tpy; Total PM2.5 = 9.96 tpy

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

Yes No (if "yes", ADEM Form 110 must be completed and attached)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

11. 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	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (feet)	GEP Stack Height (feet)	Base Elevation (feet)	Inside Diameter for Round Opening (feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp (°F)
			E-W (km)	N-S (km)	LAT	LONG								
CDK-3 STK1	Vertical Stack	<input type="checkbox"/>	401593	3428259			35	50	43	2.83	N/A	42.3	16000	215
CDK-3 STK2	Vertical Stack	<input type="checkbox"/>	401654	3428260			35	50	43	2.83	N/A	42.3	16000	215
CDK-4 STK1	Vertical Stack	<input type="checkbox"/>	TBD	TBD			35	50	43	2.83	N/A	42.3	16000	215
CDK-4 STK1	Vertical Stack	<input type="checkbox"/>	TBD	TBD			35	50	43	2.83	N/A	42.3	16000	215
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												

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

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
CDK3 (Point Emissions)	<input type="checkbox"/>	Filterable PM	0.119	0.520			NEI & Similar Kilns	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.219	0.960			NEI & Similar Kilns	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}	0.2161	0.946			NEI & Similar Kilns	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.08219	0.36			NEI & Similar Kilns	
	<input type="checkbox"/>	NO _x	1.76471	7.73			AP-42 Sec 1.4	
	<input type="checkbox"/>	CO	2.96471	12.99			AP-42 Sec 1.4	
	<input type="checkbox"/>	VOC	43.5854	190.9			WPP1	4.75 lb/MBF
	<input type="checkbox"/>	SO ₂	0.02118	0.09			AP-42 Sec 1.4	
	<input type="checkbox"/>	Methanol	1.47032	6.44			AP-42 Sec 1.4	
	<input type="checkbox"/>	HAP	2.62289	11.49			AP-42 Sec 1.4	
CDK3 (Fugitive Emissions)	<input checked="" type="checkbox"/>	Filterable PM	0.02968	0.13			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.05482	0.24			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.05402	0.24			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Condensable PM	0.02055	0.09			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	NO _x	0.44118	1.93			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	CO	0.74118	3.25			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	VOC	10.8964	47.73			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	SO ₂	0.00529	0.02			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	Methanol	0.36758	1.61			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	HAP	0.65572	2.87			AP-42 Sec 1.4	
CDK4 (Point Emissions)	<input type="checkbox"/>	Filterable PM	0.119	0.520			NEI & Similar Kilns	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀	0.219	0.960			NEI & Similar Kilns	14.9 TPY (Facility-Wide)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

	<input type="checkbox"/>	Total PM _{2.5}	0.2161	0.946			NEI & Similar Kilns	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>	Condensable PM	0.08219	0.36			NEI & Similar Kilns	
	<input type="checkbox"/>	NO _x	1.76471	7.73			AP-42 Sec 1.4	
	<input type="checkbox"/>	CO	2.96471	12.99			AP-42 Sec 1.4	
	<input type="checkbox"/>	VOC	43.5854	190.9			WPP1	4.75 lb/MBF
	<input type="checkbox"/>	SO ₂	0.02118	0.09			AP-42 Sec 1.4	
	<input type="checkbox"/>	Methanol	1.47032	6.44			AP-42 Sec 1.4	
	<input type="checkbox"/>	HAP	2.62289	11.49			AP-42 Sec 1.4	
CDK 4 (Fugitive Emissions)	<input checked="" type="checkbox"/>	Filterable PM	0.02968	0.13			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.05482	0.24			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.05402	0.24			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	Condensable PM	0.02055	0.09			NEI & Similar Kilns	
	<input checked="" type="checkbox"/>	NO _x	0.44118	1.93			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	CO	0.74118	3.25			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	VOC	10.8964	47.73			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	SO ₂	0.00529	0.02			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	Methanol	0.36758	1.61			AP-42 Sec 1.4	
	<input checked="" type="checkbox"/>	HAP	0.65572	2.87			AP-42 Sec 1.4	

13. On a separate sheet, provide a flow diagram to:
- (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.

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

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

Yes No

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

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

Yes No

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

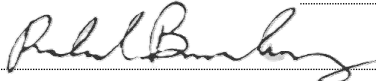
Yes No

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.)
N/A			

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/12/2026

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

1. Name of facility or organization: New South Lumber Company - Bucks 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: _____

Dried rough lumber will be sent from the lumber kilns to be finished in the planer mill. Each board will be passed through a planer to dress the surface and finish the board to its final thickness and width. Dry shavings from the planer mill will be collected and pneumatically conveyed through a closed loop cyclone to a baghouse then to a truckload bin, where it is stored until sold and loaded into trucks. After planing, each board will be grade stamped and packaged for shipping. The finished product will then be stored in inventory or loaded and shipped off-site.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Planer Mill

Source Classification Code(s): 30700710

Equipment manufacturer's information

Make: Comact Model: Various

Rated process capacity (manufacturer's or designer's guaranteed maximum): 64.2 MBF/hr

Manufactured date: 2023

Proposed installation date: 2026 (Controls)

Original installation date (if existing): 2024 (Planer Mill)

Reconstruction/Modification date (if applicable): N/A

4. Normal schedule of operation:

Hours per day: 16 Days per week: 7 Weeks per year: 52

Peak production season (if any): N/A

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

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
Dry Lumber	64.2 MBF/hr	64.2 MBF/hr	385 MMBF/yr
Dry Shavings	66,604	80,000	133,208

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM form 104): _____ MMBtu/hr

Primary:

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

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						

7. Products of process or unit:

Products	Quantity/year	Units of production
Dry Lumber	385,000,000	BF/yr
Dry Shavings	133,208	tons/yr

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions
Planer Mill limited to 385 MMBF during any rolling 12-month period.

9. Are you requesting a limitation for permitting? Yes No if "yes", specify the limit and affected unit(s):

PM PSD SMS facility-wide limits as follows:

Filterable PM = 24.9 tpy; Total PM10 = 14.9 tpy; Total PM2.5 = 9.96 tpy

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

Yes No (if "yes", ADEM Form 110 must be completed and attached)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

11. 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	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (feet)	GEP Stack Height (feet)	Base Elevation (feet)	Inside Diameter for Round Opening (feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp (°F)
			E-W (km)	N-S (km)	LAT	LONG								
PLN1 - DC1	TBD	<input type="checkbox"/>	401601	3428641	30.9872	-88.0306	TBD		43	5		84.13	99,090	70
		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												
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* Std temperature is 68°F - Std pressure is 29.92" in Hg.

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
PLN1-DC1	<input type="checkbox"/>	Filterable PM			0.186	0.558	Manufacturer's Guarantee	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀			0.186	0.558	Manufacturer's Guarantee	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}			0.186	0.558	Manufacturer's Guarantee	9.96 TPY (Facility-Wide)
	<input type="checkbox"/>							
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13. On a separate sheet, provide a flow diagram to:
- (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.

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

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

Yes No

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

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

Yes No

16. 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.)
N/A			

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/12/2026

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

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Do not write in this space

- Name of facility or organization: New South Lumber Company - Bucks Sawmill
- 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: _____

Logs entering the sawmill building will be converted into various sized green timbers or dimension lumber using a series of sawing techniques. Dimension lumber and timbers will be sawed, trimmed at the green trimmer, sorted by length and dimension, stacked on sticks, and sold as rough green lumber or sent to the lumber kilns for drying. Large defect pieces from the sawmill will be chipped and sold as a byproduct or distributed for other purposes. Sawdust created during sawmill production will be pneumatic transferred to one of two fuel silos, each controlled by a cyclone.

- Type of unit or process (e.g., calcining kiln, cupola furnace): Sawmill

Source Classification Code(s): 30700802; 30700804

Equipment manufacturer's information

Make: Comact Model: Various

Rated process capacity (manufacturer's or designer's guaranteed maximum): 64.2 MBF/hr

Manufactured date: 2023

Proposed installation date: _____

Original installation date (if existing): 2024

Reconstruction/Modification date (if applicable): N/A

- Normal schedule of operation:

Hours per day: 16 Days per week: 5 Weeks per year: 52

Peak production season (if any): N/A

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

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
Logs	558,250	558,250	1,674,750
Bark	55,825	55,825	167,475
Chips	150,728	150,728	452,183
Green Sawdust	39,078	39,078	117,233

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM form 104): _____ MMBtu/hr

Primary:

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

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						

7. Products of process or unit:

Products	Quantity/year	Units of production
Lumber	240,000,000	BF/yr
Chips	452,183	tons/yr
Sawdust	117,233	tons/yr
Bark	167,475	tons/yr

8. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions
 Sawmill operations limited to 6,000 hours during any rolling 12-month period.

9. Are you requesting a limitation for permitting? Yes No if "yes", specify the limit and affected unit(s):

PM PSD SMS facility-wide limits as follows:

Filterable PM = 24.9 tpy; Total PM10 = 14.9 tpy; Total PM2.5 = 9.96 tpy

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

Yes No (if "yes", ADEM Form 110 must be completed and attached)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

11. 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	Emission Point Type	Merged Stack**	Stack											
			UTM Coordinates		Geographic Coordinates		Height Above Grade (feet)	GEP Stack Height (feet)	Base Elevation (feet)	Inside Diameter for Round Opening (feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/sec)	Volume of Gas Discharged (ACFM)	Exit Gas Temp (°F)
			E-W (km)	N-S (km)	LAT	LONG								
Fuel Silo Cyclone No. 1	H	<input type="checkbox"/>	401595	3428315			140		43	6		58.33	10,200	Ambient
Fuel Silo Cyclone No. 2	H	<input type="checkbox"/>	401650	3428303			140		43	6		58.33	10,200	Ambient
		<input type="checkbox"/>												
		<input type="checkbox"/>												
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		<input type="checkbox"/>												
		<input type="checkbox"/>												
		<input type="checkbox"/>												

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

** If this is a merged stack with multiple units using this release point, please provide additional information including which units and any different operating scenarios.

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

12. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations. Attach calculation worksheets. Fugitive emissions must be included (enter on separate line and check box for Fugitive). Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

EMISSION POINT	FUGITIVE Check if fugitive	POLLUTANT	UNCONTROLLED POTENTIAL EMISSIONS		CONTROLLED POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative UOM
			lb/hr	ton/yr	lb/hr	ton/yr		
Fuel Silo Cyclone No. 1	<input type="checkbox"/>	Filterable PM			1.46	4.38	SMS Limit	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀			0.20	0.60	SMS Limit	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}			0.02	0.06	SMS Limit	9.96 TPY (Facility-Wide)
Fuel Silo Cyclone No. 2	<input type="checkbox"/>	Filterable PM			1.46	4.38	SMS Limit	24.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM ₁₀			0.20	0.60	SMS Limit	14.9 TPY (Facility-Wide)
	<input type="checkbox"/>	Total PM _{2.5}			0.02	0.06	SMS Limit	9.96 TPY (Facility-Wide)
Log Debarking	<input checked="" type="checkbox"/>	Filterable PM	2.01	6.03			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM ₁₀	1.00	3.01			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.50	1.51			EPA Region 10	
Bark Hogging	<input checked="" type="checkbox"/>	Filterable PM	0.07	0.20			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.03	0.10			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.02	0.05			EPA Region 10	
Log Chipping	<input checked="" type="checkbox"/>	Filterable PM	0.54	1.63			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM ₁₀	0.27	0.81			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	0.14	0.41			EPA Region 10	
Sawing	<input checked="" type="checkbox"/>	Filterable PM	9.77	29.31			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM ₁₀	4.88	14.65			EPA Region 10	
	<input checked="" type="checkbox"/>	Total PM _{2.5}	2.44	7.33			EPA Region 10	

13. On a separate sheet, provide a flow diagram to:
- (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.

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

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

Yes No

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

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

Yes No

16. 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.)
N/A			

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/12/2026

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**



**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

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Do not write in this space

1. Name of facility or organization New South Lumber Company - Bucks Sawmill

2. Purpose of Application:

<input type="checkbox"/> Initial installation of a new engine (i.e. engine that has never been in service at any location) <input type="checkbox"/> Initial installation of a used engine (i.e. engine that has been in service at another location) <input type="checkbox"/> Modification/Reconstruction of an engine currently installed at the facility <input type="checkbox"/> Update information for an engine currently installed at the facility <input type="checkbox"/> Title V Application <input checked="" type="checkbox"/> Other, specify: <u>Retroactive PSD Permitting</u>	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: <u>2024</u>
--	--

3. Engine Identification:

A. Manufacturer Name: <u>Clarke Fire Pump Engines</u>	B. Model No.: <u>JU6H-UFADX8</u>	C. Model Year: <u>2024</u>
D. Facility's Identification or Description: <u>Emergency Fire Water Pump</u>		E. Serial No.: _____

4. Engine Applicability Dates:

A. Date Ordered (New): <u>2024</u>	B. Date Manufactured: <u>2024</u>	C. Date Modified/Reconstructed <u>N/A</u>
D. For a used engine, approximate date engine was first put in service at any location: _____		

5. Engine Function:

<input type="checkbox"/> Compression <input type="checkbox"/> NFPA Certified <input type="checkbox"/> Test Cell/Stand <input type="checkbox"/> Research & Development	<input type="checkbox"/> Electrical Generation (Max Output): _____ <input checked="" type="checkbox"/> Fire/Other Pump Driver <input type="checkbox"/> Other, please describe: _____
--	--

6. Engine Operation:

<input type="checkbox"/> Non-Emergency (provide typical operating schedule in A-D): <input checked="" type="checkbox"/> Emergency Only <input type="checkbox"/> Limited Use (<100 hr/yr)	A. Hours/day: _____ B. Days/week: _____ C. Weeks/year: _____ D. Peak Season (if any): _____
--	--

7. Engine Specifications:

A. Max Brake Horsepower (bhp) <u>305</u>	B. Max Engine Power (kWm): <u>227.5</u>	C. Max Heat Input (MMBtu/hr): <u>2.14</u>	
D. Type:	E. Piston Movement:	F. Air/Fuel Mix:	G. Ignition Type
<input type="checkbox"/> Simple Cycle Turbine	<input type="checkbox"/> 2-Stroke RICE	<input type="checkbox"/> Rich Burn Rice	<input type="checkbox"/> Spark
<input type="checkbox"/> Combined Cycle Turbine	<input checked="" type="checkbox"/> 4-Stroke RICE	<input checked="" type="checkbox"/> Lean Burn RICE	<input checked="" type="checkbox"/> Compression
<input type="checkbox"/> Regenerative Cycle Turbine	<input type="checkbox"/> N/A	<input type="checkbox"/> Diffusion Flame Turbine	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Reciprocating Engine	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Lean Premix Turbine	
		<input type="checkbox"/> Other: _____	
H. Cylinder Displacement: <u>6.8</u>		(Liters/cylinder)	

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

8. Compressor Specifications:

A. Compressor Type _____ B. Compressor Mfg. Date _____ C. Location on well? Yes No
 D. Compressor Instal. Date: _____ E. Compressor Serial No.: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content	Fuel-Bound Nitrogen Content	% of Gross Heat Input	Max Ash %	Used Oil Supplier
			(% by weight or ppm)	(% by weight or ppm)			
Primary	Diesel	19,300 Btu/hr					
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED ¹ POTENTIAL EMISSIONS		CONTROLLED ² POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM	0.10	5.02E-03			AP-42 Section 3.3	
Total PM10	0.67	0.03			AP-42 Section 3.3	
Total PM2.5	0.67	0.03			AP-42 Section 3.3	
NOX	2.01	0.10			NSPS Subpart IIII	
CO	1.76	0.09			AP-42 Section 3.3	
VOC	0.75	0.04			AP-42 Section 3.3	
SO2	3.32E-03	1.66E-04			NSPS Subpart IIII	
HAP	8.27E-03	4.14E-04			AP-42 Section 3.3	

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- | | |
|---|--|
| <input type="checkbox"/> 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines: | <input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE |
| <input type="checkbox"/> 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines | <input checked="" type="checkbox"/> 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines | <input type="checkbox"/> 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart OOOO/OOOOa | <input type="checkbox"/> Other: _____ |

Does this unit have an EPA Certificate of Conformity? Yes No if yes, please provide: _____

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis ³	Engine Potential Emission Rate (in units of standard)
NO _x + NMHC	4.0	g/kW-hr	NSPS, Subpart IIII	6.58E-03 lb/hp-hr
CO	3.5	g/kW-hr	NSPS, Subpart IIII	5.76E-03 lb/hp-hr
SO ₂	15.0	ppmv	NSPS, Subpart IIII	1.09E-05 lb/hp-hr
Filterable PM	0.20	g/kW-hr	NSPS, Subpart IIII	3.29E-04 lb/hp-hr
Maintenance and Testing	100	hr/yr	NSPS, Subpart IIII	N/A
Operating Hours	100	hr/yr	NSPS, Subpart IIII	N/A
Opacity	20	%	335-3-4-.01(1)(a)	N/A
Opacity	40	%	335-3-4-.01(1)(a)	N/A

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, 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 Yes No
(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? Yes No

13. Pollution Control Information:

A. Device/Technology Type(s):

- 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)
- Diesel Particulate Filter
- Other _____
- Other _____

B. Control Efficiencies

Pollutant	% Reduction
NO _x	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

0

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

Yes No (if "no", a compliance schedule, ADEM Form 437, must be attached.)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

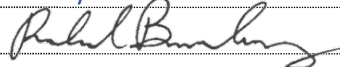
15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

Emission Point & Description: <u>Emergency Fire Water Pump</u>		Stack Type: <u>Horizontal</u>	
Stack UTM Coordinate (E-W)	<u>401731</u> (km)	Stack UTM Coordinate (N-S)	<u>3428363</u> (km)
Latitude	<u>30.98472</u> (LAT)	Longitude	<u>-88.0292</u> (LONG)
Height above grade	<u>8.5</u> (ft)	Gas temperature at exit	_____ (°F)
Inside diameter at exit (round)	<u>0.5</u> (ft)	Gas velocity	_____ (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	_____ (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	_____ (ft)
Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary)		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No :
Is this a merged stack (do multiple units use this release point)?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If yes, provide units: _____			

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Rachael Broadway

Company of preparer: Trinity Consultants

Signature:  Date: 3/6/2026

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**



**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

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Do not write in this space

1. Name of facility or organization: <u>New South Lumber Company - Bucks Sawmill</u>	
2. Purpose of Application:	
<input type="checkbox"/> Initial installation of a new engine (i.e. engine that has never been in service at any location) <input type="checkbox"/> Initial installation of a used engine (i.e. engine that has been in service at another location) <input type="checkbox"/> Modification/Reconstruction of an engine currently installed at the facility <input type="checkbox"/> Update information for an engine currently installed at the facility <input type="checkbox"/> Title V Application <input checked="" type="checkbox"/> Other, specify: <u>Retroactive PSD Permitting</u>	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: <u>2024</u>
3. Engine Identification:	
A. Manufacturer Name: <u>Generac</u>	B. Model No.: <u>SG035</u>
C. Model Year: <u>2024</u>	D. Facility's Identification or Description: <u>Emergency Generator Engine No. 1</u>
E. Serial No.: _____	
4. Engine Applicability Dates:	
A. Date Ordered (New): <u>2024</u>	B. Date Manufactured: _____
C. Date Modified/Reconstructed: _____	
D. For a used engine, approximate date engine was first put in service at any location: _____	
5. Engine Function:	
<input type="checkbox"/> Compression	<input checked="" type="checkbox"/> Electrical Generation (Max Output): <u>35</u>
<input type="checkbox"/> NFPA Certified	<input type="checkbox"/> Fire/Other Pump Driver
<input type="checkbox"/> Test Cell/Stand	<input type="checkbox"/> Other, please describe: _____
<input type="checkbox"/> Research & Development	
6. Engine Operation:	
<input type="checkbox"/> Non-Emergency (provide typical operating schedule in A-D):	A. Hours/day: _____
<input checked="" type="checkbox"/> Emergency Only	B. Days/week: _____
<input type="checkbox"/> Limited Use (<100 hr/yr)	C. Weeks/year: _____
D. Peak Season (if any): _____	
7. Engine Specifications:	
A. Max Brake Horsepower (bhp) <u>54</u>	B. Max Engine Power (kWm): <u>35</u>
C. Max Heat Input (MMBtu/hr): <u>0.38</u>	
D. Type:	E. Piston Movement:
<input type="checkbox"/> Simple Cycle Turbine	<input type="checkbox"/> 2-Stroke RICE
<input type="checkbox"/> Combined Cycle Turbine	<input checked="" type="checkbox"/> 4-Stroke RICE
<input type="checkbox"/> Regenerative Cycle Turbine	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Reciprocating Engine	<input type="checkbox"/> Other: _____
F. Air/Fuel Mix:	G. Ignition Type:
<input type="checkbox"/> Rich Burn Rice	<input checked="" type="checkbox"/> Spark
<input checked="" type="checkbox"/> Lean Burn RICE	<input type="checkbox"/> Compression
<input type="checkbox"/> Diffusion Flame Turbine	<input type="checkbox"/> N/A
<input type="checkbox"/> Lean Premix Turbine	
<input type="checkbox"/> Other: _____	
H. Cylinder Displacement: <u>0.675</u> (Liters/cylinder)	

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

8. Compressor Specifications:

A. Compressor Type _____ B. Compressor Mfg. Date _____ C. Location on well? Yes No
 D. Compressor Instal. Date: _____ E. Compressor Serial No.: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content	Fuel-Bound Nitrogen Content	% of Gross Heat Input	Max Ash %	Used Oil Supplier
			(% by weight or ppm)	(% by weight or ppm)			
Primary	Natural Gas	1,020 Btu/scf					
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED ¹ POTENTIAL EMISSIONS		CONTROLLED ² POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Total PM10	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Total PM2.5	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Condensable PM	3.75E-03	1.87E-04			AP-42 Table 3.2-2	
NOX	1.19	0.06			40 CFR 60 Subpart JJJJ	
CO	46.05	2.30			40 CFR 60 Subpart JJJJ	
VOC	6.37	0.32			40 CFR 60 Subpart JJJJ	
SO2	2.22E-04	1.11E-05			AP-42 Table 3.2-2	
HAP	4.58E-06	2.29E-07			AP-42 Table 3.2-2	

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- | | |
|--|---|
| <input type="checkbox"/> 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines | <input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE |
| <input type="checkbox"/> 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines | <input type="checkbox"/> 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines | <input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart OOOO/OOOOa | <input type="checkbox"/> Other: _____ |

if yes, please provide: _____

Does this unit have an EPA Certificate of Conformity? Yes No

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis ³	Engine Potential Emission Rate (in units of standard)
NO _x	10.0	g/hp-hr	40 CFR 60 Subpart JJJJ	2.20E-02 lb/hp-hr
CO	387.0	g/hp-hr	40 CFR 60 Subpart JJJJ	8.53E-01 lb/hp-hr
Maintenance and Testing	100.0	hr/yr	40 CFR 60 Subpart JJJJ	N/A
Operating Hours	100.0	hr/yr	40 CFR 60 Subpart JJJJ	N/A
Opacity	20	%	40 CFR 60 Subpart JJJJ	N/A
Opacity	40	%	335-3-4-.01(1)(a)	N/A

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, 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 Yes No

(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? Yes No

13. Pollution Control Information:

A. Device/Technology Type(s):

- 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)
- Diesel Particulate Filter
- Other _____
- Other _____

B. Control Efficiencies

Pollutant	% Reduction
NO _x	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

Yes No (if "no", a compliance schedule, ADEM Form 437, must be attached).

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

Emission Point & Description: Emergency Generator Engine No. 1

Stack Type: Weather Cap

Stack UTM Coordinate (E-W)	<u>401758</u> (km)	Stack UTM Coordinate (N-S)	<u>3428394</u> (km)
Latitude	<u>30.985</u> (LAT)	Longitude	<u>-88.029</u> (LONG)
Height above grade	<u>3.5</u> (ft)	Gas temperature at exit	<u>900</u> (°F)
Inside diameter at exit (round)	<u>0.83</u> (ft)	Gas velocity	<u>476.70</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>260</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	_____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units: _____

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature: 

Date: 3/6/2026

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**



**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

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Do not write in this space

1. Name of facility or organization: <u>New South Lumber Company - Bucks Sawmill</u>	
2. Purpose of Application:	
<input type="checkbox"/> Initial installation of a new engine (i.e. engine that has never been in service at any location) <input type="checkbox"/> Initial installation of a used engine (i.e. engine that has been in service at another location) <input type="checkbox"/> Modification/Reconstruction of an engine currently installed at the facility <input type="checkbox"/> Update information for an engine currently installed at the facility <input type="checkbox"/> Title V Application <input checked="" type="checkbox"/> Other, specify: <u>Retroactive PSD Permitting</u>	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: <u>2024</u>
3. Engine Identification:	
A. Manufacturer Name: <u>Generac</u>	B. Model No.: <u>SG035</u>
C. Model Year: <u>2024</u>	D. Facility's Identification or Description: <u>Emergency Generator Engine No. 2</u>
E. Serial No.: _____	
4. Engine Applicability Dates:	
A. Date Ordered (New): <u>2024</u>	B. Date Manufactured: _____
C. Date Modified/Reconstructed: _____	
D. For a used engine, approximate date engine was first put in service at any location: _____	
5. Engine Function:	
<input type="checkbox"/> Compression	<input checked="" type="checkbox"/> Electrical Generation (Max Output): <u>35</u>
<input type="checkbox"/> NFPA Certified	<input type="checkbox"/> Fire/Other Pump Driver
<input type="checkbox"/> Test Cell/Stand	<input type="checkbox"/> Other, please describe: _____
<input type="checkbox"/> Research & Development	
6. Engine Operation:	
<input type="checkbox"/> Non-Emergency (provide typical operating schedule in A-D):	A. Hours/day: _____
<input checked="" type="checkbox"/> Emergency Only	B. Days/week: _____
<input type="checkbox"/> Limited Use (<100 hr/yr)	C. Weeks/year: _____
D. Peak Season (if any): _____	
7. Engine Specifications:	
A. Max Brake Horsepower (bhp) <u>54</u>	B. Max Engine Power (kWm): <u>35</u>
C. Max Heat Input (MMBtu/hr): <u>0.38</u>	
D. Type:	E. Piston Movement:
<input type="checkbox"/> Simple Cycle Turbine	<input type="checkbox"/> 2-Stroke RICE
<input type="checkbox"/> Combined Cycle Turbine	<input checked="" type="checkbox"/> 4-Stroke RICE
<input type="checkbox"/> Regenerative Cycle Turbine	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Reciprocating Engine	<input type="checkbox"/> Other: _____
F. Air/Fuel Mix:	G. Ignition Type:
<input type="checkbox"/> Rich Burn Rice	<input checked="" type="checkbox"/> Spark
<input checked="" type="checkbox"/> Lean Burn RICE	<input type="checkbox"/> Compression
<input type="checkbox"/> Diffusion Flame Turbine	<input type="checkbox"/> N/A
<input type="checkbox"/> Lean Premix Turbine	
<input type="checkbox"/> Other: _____	
H. Cylinder Displacement: <u>0.675</u> (Liters/cylinder)	

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

8. Compressor Specifications:

A. Compressor Type _____ B. Compressor Mfg. Date _____ C. Location on well? Yes No
 D. Compressor Instal. Date: _____ E. Compressor Serial No.: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content	Fuel-Bound Nitrogen Content	% of Gross Heat Input	Max Ash %	Used Oil Supplier
			(% by weight or ppm)	(% by weight or ppm)			
Primary	Natural Gas	1,020 Btu/scf					
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED ¹ POTENTIAL EMISSIONS		CONTROLLED ² POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Total PM10	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Total PM2.5	2.91E-05	1.46E-06			AP-42 Table 3.2-2	
Condensable PM	3.75E-03	1.87E-04			AP-42 Table 3.2-2	
NOX	1.19	5.95E-02			40 CFR 60 Subpart JJJJ	
CO	46.05	2.30			40 CFR 60 Subpart JJJJ	
VOC	6.37	0.32			40 CFR 60 Subpart JJJJ	
SO2	2.22E-04	1.11E-05			AP-42 Table 3.2-2	
HAP	4.58E-06	2.29E-07			AP-42 Table 3.2-2	

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- | | |
|--|---|
| <input type="checkbox"/> 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines | <input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE |
| <input type="checkbox"/> 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines | <input type="checkbox"/> 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines | <input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart OOOO/OOOOa | <input type="checkbox"/> Other: _____ |

if yes, please provide: _____

Does this unit have an EPA Certificate of Conformity? Yes No

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis ³	Engine Potential Emission Rate (in units of standard)
NO _x	10.0	g/hp-hr	NSPS, Subpart JJJJ	2.20E-02 lb/hp-hr
CO	387.0	g/hp-hr	NSPS, Subpart JJJJ	8.53E-01 lb/hp-hr
Maintenance and Testing	100.0	hr/yr	NSPS, Subpart JJJJ	N/A
Operating Hours	100.0	hr/yr	NSPS, Subpart JJJJ	N/A
Opacity	20	%	335-3-4-.01(1)(a)	N/A
Opacity	40	%	335-3-4-.01(1)(a)	N/A

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, 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 Yes No

(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? Yes No

13. Pollution Control Information:

A. Device/Technology Type(s):

- No Controls
- Air-to-Fuel Ratio Controller
- Water or Steam Injection
- Low NOx Burners
- Oxidation Catalyst
- Selective Non-catalytic Reduction (SNCR)
- Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- Selective Catalytic Reduction (SCR)
- Diesel Particulate Filter
- Other _____
- Other _____

B. Control Efficiencies

Pollutant	% Reduction
NO _x	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

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

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

Emission Point & Description: Emergency Generator Engine No. 2

Stack Type: Weather Cap

Stack UTM Coordinate (E-W)	<u>401920</u> (km)	Stack UTM Coordinate (N-S)	<u>3428639</u> (km)
Latitude	<u>30.9872</u> (LAT)	Longitude	<u>-88.027</u> (LONG)
Height above grade	<u>3.5</u> (ft)	Gas temperature at exit	<u>1,342</u> (°F)
Inside diameter at exit (round)	<u>0.83</u> (ft)	Gas velocity	<u>442.23</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>241.2</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	_____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

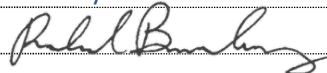
Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units: _____

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature: 

Date: 3/6/2026

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**



**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

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Do not write in this space

1. Name of facility or organization: <u>New South Lumber Company - Bucks Sawmill</u>	
2. Purpose of Application:	
<input type="checkbox"/> Initial installation of a new engine (i.e. engine that has never been in service at any location) <input type="checkbox"/> Initial installation of a used engine (i.e. engine that has been in service at another location) <input type="checkbox"/> Modification/Reconstruction of an engine currently installed at the facility <input type="checkbox"/> Update information for an engine currently installed at the facility <input type="checkbox"/> Title V Application <input checked="" type="checkbox"/> Other, specify: <u>Retroactive PSD Permitting</u>	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: <u>2024</u>
3. Engine Identification:	
A. Manufacturer Name: <u>Generac</u>	B. Model No.: <u>SG045</u>
C. Model Year: <u>2024</u>	D. Facility's Identification or Description: <u>Emergency Generator Engine No. 3</u>
E. Serial No.: _____	
4. Engine Applicability Dates:	
A. Date Ordered (New): <u>2024</u>	B. Date Manufactured: _____
C. Date Modified/Reconstructed: _____	
D. For a used engine, approximate date engine was first put in service at any location: _____	
5. Engine Function:	
<input type="checkbox"/> Compression	<input checked="" type="checkbox"/> Electrical Generation (Max Output): <u>45</u>
<input type="checkbox"/> NFPA Certified	<input type="checkbox"/> Fire/Other Pump Driver
<input type="checkbox"/> Test Cell/Stand	<input type="checkbox"/> Other, please describe: _____
<input type="checkbox"/> Research & Development	
6. Engine Operation:	
<input type="checkbox"/> Non-Emergency (provide typical operating schedule in A-D):	A. Hours/day: _____
<input checked="" type="checkbox"/> Emergency Only	B. Days/week: _____
<input type="checkbox"/> Limited Use (<100 hr/yr)	C. Weeks/year: _____
D. Peak Season (if any): _____	
7. Engine Specifications:	
A. Max Brake Horsepower (bhp) <u>69</u>	B. Max Engine Power (kWm): <u>45</u>
C. Max Heat Input (MMBtu/hr): <u>0.48</u>	
D. Type:	E. Piston Movement:
<input type="checkbox"/> Simple Cycle Turbine	<input type="checkbox"/> 2-Stroke RICE
<input type="checkbox"/> Combined Cycle Turbine	<input checked="" type="checkbox"/> 4-Stroke RICE
<input type="checkbox"/> Regenerative Cycle Turbine	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Reciprocating Engine	<input type="checkbox"/> Other: _____
F. Air/Fuel Mix:	G. Ignition Type:
<input type="checkbox"/> Rich Burn Rice	<input checked="" type="checkbox"/> Spark
<input checked="" type="checkbox"/> Lean Burn RICE	<input type="checkbox"/> Compression
<input type="checkbox"/> Diffusion Flame Turbine	<input type="checkbox"/> N/A
<input type="checkbox"/> Lean Premix Turbine	
<input type="checkbox"/> Other: _____	
H. Cylinder Displacement: <u>1.125</u> (Liters/cylinder)	

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

8. Compressor Specifications:

A. Compressor Type _____ B. Compressor Mfg. Date _____ C. Location on well? Yes No
 D. Compressor Instal. Date: _____ E. Compressor Serial No.: _____ F. Compressor Brake Horsepower (bhp): _____

9. Fuel Information:

	Fuel Type/ Desc.	Heat Content	Sulfur Content	Fuel-Bound Nitrogen Content	% of Gross Heat Input	Max Ash %	Used Oil Supplier
			(% by weight or ppm)	(% by weight or ppm)			
Primary	Natural Gas	1,020 Btu/scf					
Secondary/ Backup							

10. Point Source Emissions:

POLLUTANT	UNCONTROLLED ¹ POTENTIAL EMISSIONS		CONTROLLED ² POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT Provide in lb/hr or specify alternative Unit of Measure
	lb/hr	ton/yr	lb/hr	ton/yr		
Filterable PM	3.72E-05	1.86E-06			AP-42 Table 3.2-2	
Total PM10	3.72E-05	1.86E-06			AP-42 Table 3.2-2	
Total PM2.5	3.72E-05	1.86E-06			AP-42 Table 3.2-2	
Condensable PM	4.79E-03	2.39E-04			AP-42 Table 3.2-2	
NOX	1.52	0.08			40 CFR 60 Subpart JJJJ	
CO	58.84	2.94			40 CFR 60 Subpart JJJJ	
VOC	8.14	0.41			40 CFR 60 Subpart JJJJ	
SO2	2.84E-04	1.42E-05			AP-42 Table 3.2-2	
HAP	7.48E-06	3.74E-07			AP-42 Table 3.2-2	

Attach calculation worksheets. Manufacturer specification sheets should be provided if used as the basis for emission estimates. Particulate emissions should be speciated to include PM10-filterable, PM2.5-filterable, and PM-condensable. Speciated HAP emissions should also be provided. Attach additional page(s) as necessary.

11. Applicable Regulations:

- | | |
|--|---|
| <input type="checkbox"/> 40 CFR 63, Subpart YYYY, NESHAP for Stat. Combustion Turbines | <input checked="" type="checkbox"/> 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE |
| <input type="checkbox"/> 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines | <input type="checkbox"/> 40 CFR 60, Subpart IIII, NSPS for Stat. Compression Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart KKKK, NSPS for Stat. Combustion. Turbines | <input checked="" type="checkbox"/> 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE |
| <input type="checkbox"/> 40 CFR 60, Subpart OOOO/OOOOa | <input type="checkbox"/> Other: _____ |

if yes, please provide: _____

Does this unit have an EPA Certificate of Conformity? Yes No

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. Regulatory Standards, Limitations, and Requirements:

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis ³	Engine Potential Emission Rate (in units of standard)
NO _x	10.0	g/hp-hr	NSPS, Subpart JJJ	2.20E-02 lb/hp-hr
CO	387.0	g/hp-hr	NSPS, Subpart JJJ	8.53E-01 lb/hp-hr
Maintenance and Testing	100.0	hr/yr	NSPS, Subpart JJJ	N/A
Operating Hours	100.0	hr/yr	NSPS, Subpart JJJ	N/A
Opacity	20	%	335-3-4-.01(1)(a)	N/A
Opacity	40	%	335-3-4-.01(1)(a)	N/A

3. for federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit, 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 Yes No

(if yes, provide a copy of the certification)

C. For emergency or limited use engines, is this engine equipped with a non-resettable hour meter? Yes No

13. Pollution Control Information:

A. Device/Technology Type(s):

- 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)
- Diesel Particulate Filter
- Other _____
- Other _____

B. Control Efficiencies

Pollutant	% Reduction
NO _x	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this item in compliance with all applicable air pollution rules and regulations?

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

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

15. Stack Parameters (if a control device is installed, the information should be for the control device's stack exit):

Emission Point & Description: Emergency Generator Engine No. 3

Stack Type: Weather Cap

Stack UTM Coordinate (E-W)	<u>401600</u> (km)	Stack UTM Coordinate (N-S)	<u>3428488</u> (km)
Latitude	<u>30.9858</u> (LAT)	Longitude	<u>-88.031</u> (LONG)
Height above grade	<u>3.5</u> (ft)	Gas temperature at exit	<u>1,361</u> (°F)
Inside diameter at exit (round)	<u>0.83</u> (ft)	Gas velocity	<u>442.23</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>241.2</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	_____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :


Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units: _____

16. Clarifying/Supplemental Information (Optional):

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature: 

Date: 3/6/2026



**PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

- -

Do not write in this space

1. Name of facility or organization New South Lumber Company - Bucks Sawmill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- | | |
|---|---|
| <input type="checkbox"/> Settling chamber | <input type="checkbox"/> Electrostatic precipitator |
| <input type="checkbox"/> Afterburner | <input type="checkbox"/> Baghouse |
| <input checked="" type="checkbox"/> Cyclone | <input type="checkbox"/> Multiclone |
| <input type="checkbox"/> Absorber | <input type="checkbox"/> Adsorber |
| <input type="checkbox"/> Condenser | <input type="checkbox"/> Wet Suppression |
| <input type="checkbox"/> Thermal Oxidizer | |
| <input type="checkbox"/> Wet scrubber (kind): _____ | |
| <input type="checkbox"/> Other (describe): _____ | |

3. Control device manufacturer's information:

Name of manufacturer Western Pneumatics LLC Model No. _____

1. Emission source(s) to which device is installed or is to be installed:

Green Sawdust Silo No. 1

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM ₁₀	PM _{2.5}

Mass emission Rate (#/hr)			
Uncontrolled.....	4862.00	670.96	68.07
Designed.....	1.46	0.20	0.02
Manufacturer's guaranteed.....			
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	31.74 lbs/hr		
Manufacturer's guaranteed.....			
Removal efficiency (%)			
Designed.....	99.97%		
Manufacturer's guaranteed.....	99.97%		

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)			
(ACFM, existing conditions)			10,200
Temperature (°F)			Ambient
Velocity (ft/sec)			58.33
Percent moisture			

Pressure drop across device: 8 to 10 (inches H₂O)

7. Stack dimensions:

Stack No. & Description: Fuel Silo Cyclone No. 1 Stack Type: Horizontal

Stack UTM Coordinate (E-W)	<u>401595.1</u> (km)	Stack UTM Coordinate (N-S)	<u>3428315</u> (km)
Latitude	<u>30.984249</u> (LAT)	Longitude	<u>-88.0306</u> (LONG)
Height above grade	_____ (ft)	Gas temperature at exit	<u>Ambient</u> (°F)
Inside diameter at exit (round)	<u>6</u> (ft)	Gas velocity	<u>58.33</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>10,200</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	<u>140</u> (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units:

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.

9. Enclosed are:

- | | |
|--|--|
| <input type="checkbox"/> Blueprints | <input type="checkbox"/> Particle size distribution report |
| <input checked="" type="checkbox"/> Manufacturer's literature | <input type="checkbox"/> Size efficiency- curves |
| <input type="checkbox"/> Emissions test of existing installation | <input type="checkbox"/> Fan curves |
| <input type="checkbox"/> Other _____ | |

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.)

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

12. By-pass (if any) is to be used and when:

N/A

13. Disposal of collected air pollutants:

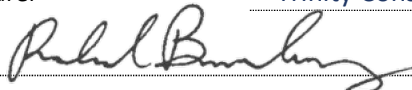
	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is the waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Green sawdust is captured and used as a fuel source for BM CDKs.

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/6/2026



PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

- -

Do not write in this space

1. Name of facility or organization New South Lumber Company - Bucks Sawmill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- | | |
|---|---|
| <input type="checkbox"/> Settling chamber | <input type="checkbox"/> Electrostatic precipitator |
| <input type="checkbox"/> Afterburner | <input type="checkbox"/> Baghouse |
| <input checked="" type="checkbox"/> Cyclone | <input type="checkbox"/> Multiclone |
| <input type="checkbox"/> Absorber | <input type="checkbox"/> Adsorber |
| <input type="checkbox"/> Condenser | <input type="checkbox"/> Wet Suppression |
| <input type="checkbox"/> Thermal Oxidizer | |
| <input type="checkbox"/> Wet scrubber (kind): _____ | |
| <input type="checkbox"/> Other (describe): _____ | |

3. Control device manufacturer's information:
 Name of manufacturer Western Pneumatics LLC Model No. _____

1. Emission source(s) to which device is installed or is to be installed:
Green Sawdust Silo No. 2

2. Emission parameters:	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM ₁₀	PM _{2.5}
Mass emission Rate (#/hr)			
Uncontrolled.....	4862.00	670.96	68.07
Designed.....	1.46	0.20	0.02
Manufacturer's guaranteed.....			
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	31.74 lbs/hr		
Manufacturer's guaranteed.....			
Removal efficiency (%)			
Designed.....	99.97%		
Manufacturer's guaranteed.....	99.97%		

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)			
(ACFM, existing conditions)			10,200
Temperature (°F)			Ambient
Velocity (ft/sec)			58.33
Percent moisture			

Pressure drop across device: 8 to 10 (inches H₂O)

7. Stack dimensions:

Stack No. & Description: Fuel Silo Cyclone No. 2 Stack Type: Horizontal

Stack UTM Coordinate (E-W)	<u>401649.8</u> (km)	Stack UTM Coordinate (N-S)	<u>3428303</u> (km)
Latitude	<u>30.984173</u> (LAT)	Longitude	<u>-88.0300</u> (LONG)
Height above grade	_____ (ft)	Gas temperature at exit	<u>Ambient</u> (°F)
Inside diameter at exit (round)	<u>6</u> (ft)	Gas velocity	<u>58.33</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>10,200</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	<u>140</u> (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units:

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.

9. Enclosed are:

- | | |
|--|--|
| <input type="checkbox"/> Blueprints | <input type="checkbox"/> Particle size distribution report |
| <input checked="" type="checkbox"/> Manufacturer's literature | <input type="checkbox"/> Size efficiency- curves |
| <input type="checkbox"/> Emissions test of existing installation | <input type="checkbox"/> Fan curves |
| <input type="checkbox"/> Other _____ | |

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.)

New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms

12. By-pass (if any) is to be used and when:

N/A

13. Disposal of collected air pollutants:

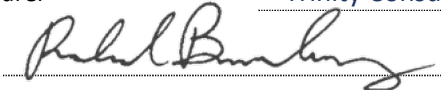
	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition				
Is the waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Green sawdust is captured and used as a fuel source for BM CDKs.

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/6/2026



**PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

- -

Do not write in this space

1. Name of facility or organization New South Lumber Company - Bucks Sawmill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- | | |
|---|---|
| <input type="checkbox"/> Settling chamber | <input type="checkbox"/> Electrostatic precipitator |
| <input type="checkbox"/> Afterburner | <input type="checkbox"/> Baghouse |
| <input checked="" type="checkbox"/> Cyclone | <input type="checkbox"/> Multiclone |
| <input type="checkbox"/> Absorber | <input type="checkbox"/> Adsorber |
| <input type="checkbox"/> Condenser | <input type="checkbox"/> Wet Suppression |
| <input type="checkbox"/> Thermal Oxidizer | |
| <input type="checkbox"/> Wet scrubber (kind): _____ | |
| <input type="checkbox"/> Other (describe): _____ | |

3. Control device manufacturer's information:

Name of manufacturer Air Systems Mfg. of Lenoir, Inc. Model No. ASM # 25-354

1. Emission source(s) to which device is installed or is to be installed:

Planer Mill

2. Emission parameters:

Pollutants Removed		
Pollutant #1	Pollutant #2	Pollutant #3
See Planer Mill Baghouse 110 Form		

Mass emission Rate (#/hr)			
Uncontrolled.....			
Designed.....			
Manufacturer's guaranteed.....			
Mass emission rate (Expressed as units of standard)			
Required by regulation.....			
Manufacturer's guaranteed.....			
Removal efficiency (%)			
Designed.....			
Manufacturer's guaranteed.....			

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)		98,654	
(ACFM, existing conditions)		99,090	
Temperature (°F)		70	
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H₂O)

7. Stack dimensions:

Stack No. & Description: See Form 110 for Planer Mill Baghouse Stack Type: _____

Stack UTM Coordinate (E-W)	_____ (km)	Stack UTM Coordinate (N-S)	_____ (km)
Latitude	_____ (LAT)	Longitude	_____ (LONG)
Height above grade	_____ (ft)	Gas temperature at exit	_____ (°F)
Inside diameter at exit (round)	_____ (ft)	Gas velocity	_____ (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	_____ (ACFM)
Base Elevation	_____ (ft)	GEP Stack Height	_____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units:

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.

9. Enclosed are:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Blueprints | <input type="checkbox"/> Particle size distribution report |
| <input type="checkbox"/> Manufacturer's literature | <input type="checkbox"/> Size efficiency- curves |
| <input type="checkbox"/> Emissions test of existing installation | <input type="checkbox"/> Fan curves |
| <input type="checkbox"/> Other _____ | |

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.)

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. By-pass (if any) is to be used and when:

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition	Dry Shavings			
Is the waste hazardous?	No			
Method of disposal	Sold			
Final destination				

If collected air pollutants are recycled, describe:

Dry shavings are collected by the cyclone-baghouse system and pneumatically conveyed via the cyclone to a truck bin, where stored until sold and loaded into trucks.

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/6/2026



**PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION**

- -

Do not write in this space

1. Name of facility or organization New South Lumber Company - Bucks Sawmill

2. Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)

- | | |
|---|---|
| <input type="checkbox"/> Settling chamber | <input type="checkbox"/> Electrostatic precipitator |
| <input type="checkbox"/> Afterburner | <input checked="" type="checkbox"/> Baghouse |
| <input type="checkbox"/> Cyclone | <input type="checkbox"/> Multiclone |
| <input type="checkbox"/> Absorber | <input type="checkbox"/> Adsorber |
| <input type="checkbox"/> Condenser | <input type="checkbox"/> Wet Suppression |
| <input type="checkbox"/> Thermal Oxidizer | |
| <input type="checkbox"/> Wet scrubber (kind): _____ | |
| <input type="checkbox"/> Other (describe): _____ | |

3. Control device manufacturer's information:

Name of manufacturer Boulware Equipment LLC Model No. 24-960-12 SuperCan

1. Emission source(s) to which device is installed or is to be installed:

Planer Mill

2. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission Rate (#/hr)			
Uncontrolled.....	3.7	3.7	3.7
Designed.....	0.186	0.186	0.186
Manufacturer's guaranteed.....			
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	24.9 TPY	14.9 TPY	9.96 TPY
Manufacturer's guaranteed.....			
Removal efficiency (%)			
Designed.....	95.00%		
Manufacturer's guaranteed.....	95.00%		

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)			98,654
(ACFM, existing conditions)			99,090
Temperature (°F)			70
Velocity (ft/sec)			
Percent moisture			10-19%

Pressure drop across device: 0-6 (inches H₂O)

7. Stack dimensions:

Stack No. & Description: PLN1-DC1 - Planer Mill Baghouse Stack Type: _____

Stack UTM Coordinate (E-W)	<u>401601.25</u> (km)	Stack UTM Coordinate (N-S)	<u>3428641</u> (km)
Latitude	<u>30.987222</u> (LAT)	Longitude	<u>-88.0306</u> (LONG)
Height above grade	_____ (ft)	Gas temperature at exit	<u>70</u> (°F)
Inside diameter at exit (round)	<u>5</u> (ft)	Gas velocity	<u>84.13</u> (ft/Sec)
Inside area at exit (not round)	_____ (ft ²)	Volume of gas discharged	<u>99,090</u> (ACFM)
Base Elevation	<u>43</u> (ft)	GEP Stack Height	_____ (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) Yes No :

Is this a merged stack (do multiple units use this release point)? Yes No

If yes, provide units:

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.

9. Enclosed are:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Blueprints | <input type="checkbox"/> Particle size distribution report |
| <input type="checkbox"/> Manufacturer's literature | <input type="checkbox"/> Size efficiency- curves |
| <input type="checkbox"/> Emissions test of existing installation | <input type="checkbox"/> Fan curves |
| <input type="checkbox"/> Other _____ | |

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.)

Air/Cloth ratio is 5.48:1

**New South Lumber Company - Bucks Sawmill
Appendix E - ADEM Application Forms**

12. By-pass (if any) is to be used and when:

Hi-Speed Abort gate to be used in the case that the spark detection system is triggered to prevent fire or combustion of dry shavings

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume				
Composition	Dry Shavings			
Is the waste hazardous?	No			
Method of disposal	Sold			
Final destination				

If collected air pollutants are recycled, describe:

Dry shavings are collected by the cyclone-baghouse system and pneumatically conveyed via the cyclone to a truck bin, where stored until sold and loaded into trucks.

Name of person preparing application: Rachael Broadway

Company of preparer Trinity Consultants

Signature:  Date: 3/12/2026

APPENDIX F. OZONE MERPS ASSESSMENT

APPENDIX F. OZONE MERPS ASSESSMENT

A source subject to Prevention of Significant Deterioration (PSD) is required to conduct dispersion modeling in order to determine an operation's impact on air quality. For pollutants emitted in excess of certain thresholds, preliminary dispersion modeling is used to determine if ground-level concentrations will exceed significant impact levels (SILs). If SILs are not exceeded, the modeling demonstration is over. If the SILs are exceeded for any pollutant, a refined modeling analysis is required. In order to avoid a complex photochemical modeling process, the EPA performed photochemical model runs with an array of hypothetical sources in locations across the continental U.S., resulting in MERP precursor emission rates (in tons per year (tpy)) that would result in concentrations equal to PSD SILs. The MERPs guidance provides a framework for calculating concentrations of secondarily formed ozone (O₃), the primary pollutant of concern in this report, that can be used to simplify and streamline the PSD and air quality analysis portion of air permit applications.

New South Lumber Company, LLC (New South)'s proposed project is subject to PSD permitting for volatile organic compounds (VOC) as a precursor to O₃. For this reason, US EPA's Modeled Emission Rates for Precursors (MERPs) was utilized to conduct an ambient air quality analysis for NSLC – a source subject to PSD permitting for VOC. The following analysis demonstrates project emissions will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) or PSD increments.

To properly conduct the analysis, EPA recommends a two-tiered approach for addressing single source impacts on O₃. Tier 1 involves the use of appropriate and technically credible relationships between emissions and ambient impacts developed from the aforementioned modeling studies determined sufficient for evaluating project impacts. Tier 2 involves chemical transport modeling. Tier 1 sufficiently demonstrates no negative impact to the air quality will result because of this project.

Following the steps outlined in US EPA's *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* dated April 30, 2019, and the supplemental April 30, 2024 memo (Guidance), the following section documents New South satisfies the compliance demonstration requirements for O₃ under the PSD program. The steps required by the EPA involve:

- ▶ Step 1 – Identify representative hypothetical source. Start with lowest, most conservative, illustrative MERPs for selected Climate Zone.
- ▶ Step 2 – Acquire source characteristics and associated source impact modeling results. Screen the closest hypothetical sources to the project facility by selecting the lowest, most conservative MERPs.
- ▶ Step 3 - Apply source characteristics and photochemical modeling results from Step 2 to the MERP equation with the appropriate SIL value to assess the project source impacts.

Following the above steps, the contribution of VOC and nitrogen oxides (NO_x) – the applicable precursors to O₃ involved in this NSLC project – have been evaluated.

New South project proposes an increase in emissions of 917.79 tpy and 45.25 tpy of VOC and NO_x, respectively. Being located in Bucks, AL, there are no unusual circumstances regarding complex terrain, proximity to very large sources of NO_x or VOC, or meteorology.

As EPA recommends NO_x and VOC precursor impacts on 8-hr daily maximum O₃ be considered concurrently to determine if the project source's air quality impact would exceed the O₃ SIL, the project emissions increase is evaluated, and the concentration based impact of the hypothetical source (in ppb) is scaled by the ratio of the project emissions increase (for both NO_x and VOC) to the hypothetical source emissions of NO_x and VOC, and multiplied by the hypothetical source modeled concentration to evaluate an estimated project based impact. If the derived concentration value is less than 1 ppb, it will be less than the O₃ EPA SIL value from modeling guidance.

Based on data evaluated and downloaded from the EPA Qlik website (<https://www.epa.gov/scram/merps-view-qlik>), the following table was created for the hypothetical source of interest (Autauga County), which is a comparable source based on relevant characteristics and setting. The data from EPA Qlik website is represented in Table 1.

Table 1. Hypothetical Precursor, Pollutant, State, County, Emissions, Stack Height, MERP, and Climate Zone Information (Excerpt from EPA's SCRAM website)

Precursor	Pollutant	State	County	Emission (tpy)	Stack Height (m)	Max Concentration (ppb)	Climate Zone
VOC	O ₃	AL	Autauga	1,000	10	0.15333	Southeast
NO _x	O ₃	AL	Autauga	500	10	2.01172	Southeast

The project stacks are 35 feet (10.67 meters), indicating a stack height of 10 meters is more appropriate than 90 meters. Project emissions are 45.25 tpy NO_x and 917.79 tpy VOC (including both point source and fugitive emissions). As such, the EPA modeled emission rates of 500 tpy for NO_x and 1,000 tpy VOC are most representative. Due to the similar geographical characteristics of Autauga County and Mobile County, Alabama, the meteorology can also be considered adequately characterized. Moreover, because the New South facility is in the same region as the hypothetical source, background pollutant concentrations and emissions can be assumed to be reasonably similar.

To account for additive precursor impacts on 8-hr daily maximum O₃, the project impact was calculated using the following equation:

$$\text{Project Impact (ppb)} = \text{tpy NO}_x \text{ from source} / \text{tpy hypothetical source NO}_x \text{ Emission} \times \text{Max Modeled Concentration (ppb)} + \text{tpy VOC from source} / \text{tpy hypothetical source VOC Emission} \times \text{Max Modeled Concentration (ppb)}$$

and calculated as follows:

$$\begin{aligned} &= (45.25 \text{ tpy} / 500 \text{ tpy} \times 2.01172 \text{ ppb}) + (917.79 \text{ tpy} / 1000 \text{ tpy} \times 0.15333 \text{ ppb}) \\ &= (0.182 + 0.141) \text{ ppb} \\ &= 0.323 \text{ ppb} \end{aligned}$$

Based on EPA modeling results for this representative hypothetical source, the impact of the project would only be 0.323 ppb, well less than the EPA SIL of 1 ppb. Further compliance demonstration is not required.

APPENDIX G. PROPOSED PERMIT CONDITIONS AND MONITORING

**Appendix G - Proposed Permit Conditions and Monitoring
New South Lumber Company - Bucks Sawmill**

Emission Point ID No.	Operational Limit	Monitoring / Recordkeeping
CDK1 Continuous Drying Kiln No. 1	92,500 MBF/yr	New South will keep records of the board feet dried for CDK1 to ensure the kiln does not dry more than 92,500 MBF/yr. The facility will calculate the monthly and 12-month rolling total of the board footage dried within ten (10) days of the end of each calendar month. Lumber throughput records will be kept on-site to demonstrate compliance with this limitation.
	13% Minimum Moisture Content	New South will determine the moisture content of the dried lumber as measured at the planer mill. The facility will calculate and record 12-month rolling average moisture content within ten days of the end of each calendar month to determine whether the average moisture context exceeds 13% for the previous 12-month period. Moisture content of the dried lumber will be measured for each pack processed in the planer mill. Moisture content records will be maintained on-site to demonstrate compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking total board feet dried in CDK1. The facility will calculate the PM emissions using the lb/MBF emission factor multiplied by the actual board feet dried and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
CDK2 Continuous Drying Kiln No. 2	92,500 MBF/yr	New South will keep records of the board feet dried for CDK1 to ensure the kiln does not dry more than 92,500 MBF/yr. The facility will calculate the monthly and 12-month rolling total of the board footage dried within ten (10) days of the end of each calendar month. Lumber throughput records will be kept on-site to demonstrate compliance with this limitation.
	13% Minimum Moisture Content	New South will determine the moisture content of the dried lumber as measured at the planer mill. The facility will calculate and record 12-month rolling average moisture content within ten days of the end of each calendar month to determine whether the average moisture context exceeds 13% for the previous 12-month period. Moisture content of the dried lumber will be measured for each pack processed in the planer mill. Moisture content records will be maintained on-site to demonstrate compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking total board feet dried in CDK2. The facility will calculate the PM emissions using the lb/MBF emission factor multiplied by the actual board feet dried and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
CDK3 Continuous Drying Kiln No. 3	100,000 MBF/yr	New South will keep records of the board feet dried for CDK3 to ensure the kiln does not dry more than 100,000 MBF/yr. The facility will calculate the monthly and 12-month rolling total of the board footage dried within ten (10) days of the end of each calendar month. Lumber throughput records will be kept on-site to demonstrate compliance with this limitation.
	13% Minimum Moisture Content	New South will determine the moisture content of the dried lumber as measured at the planer mill. The facility will calculate and record 12-month rolling average moisture content within ten days of the end of each calendar month to determine whether the average moisture context exceeds 13% for the previous 12-month period. Moisture content of the dried lumber will be measured for each pack processed in the planer mill. Moisture content records will be maintained on-site to demonstrate compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking total board feet dried in CDK3. The facility will calculate the PM emissions using the lb/MBF emission factor multiplied by the actual board feet dried and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
CDK4 Continuous Drying Kiln No. 4	100,000 MBF/yr	New South will keep records of the board feet dried for CDK4 to ensure the kiln does not dry more than 100,000 MBF/yr. The facility will calculate the monthly and 12-month rolling total of the board footage dried within ten (10) days of the end of each calendar month. Lumber throughput records will be kept on-site to demonstrate compliance with this limitation.
	13% Minimum Moisture Content	New South will determine the moisture content of the dried lumber as measured at the planer mill. The facility will calculate and record 12-month rolling average moisture content within ten days of the end of each calendar month to determine whether the average moisture context exceeds 13% for the previous 12-month period. Moisture content of the dried lumber will be measured for each pack processed in the planer mill. Moisture content records will be maintained on-site to demonstrate compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking total board feet dried in CDK4. The facility will calculate the PM emissions using the lb/MBF emission factor multiplied by the actual board feet dried and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.

**Appendix G - Proposed Permit Conditions and Monitoring
New South Lumber Company - Bucks Sawmill**

Emission Point ID No.	Operational Limit	Monitoring / Recordkeeping
Biomass Kiln Abort Stacks	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking hours of abort stack usage. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual hours of abort stack usage and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	Abort Stack Usage Log	New South will record and maintain a log of all abort stack usage for each. The log will include the date, time, length of operation, and reason for abort stack usage. This log will be kept site for review upon request. New South will optimize operation of each kiln to limit the use of abort stacks.
Fuel Silo Cyclones	6,000 hr/yr	New South will monitor sawmill operating hours on a monthly basis to ensure hours of operation do not exceed 6,000 hr/yr. The facility will calculate the monthly and 12-month rolling total of operating hours for the sawmill within ten (10) days of the end of each calendar month. Monthly operating hour records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking sawmill operating hours. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual sawmill operating hours and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the Sawmill pneumatic conveyance processes will observe all exhaust points for visible emissions a minimum of once daily during daylight hours while in operation. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.
Planer Mill Cyclone-Baghouse System	385,000 MBF/yr	New South will keep records of the board footage throughput to ensure no more than 385,000 MBF/yr are processed by the planer. The facility will calculate the monthly and 12-month rolling total of board footage planed within ten (10) days of the end of each calendar month. Lumber throughput records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking board feet planed. The facility will calculate the PM emissions using the lb/MBF emission factor multiplied by the actual board feet planed and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the Planer Mill pneumatic conveyance process will observe all exhaust points for the presence of visible emissions a minimum of once daily during daylight hours while in operation. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.
ENG1 Emergency Fire Pump Engine No. 1 (305 hp)	100 hr/yr	New South will monitor engine run hours monthly to ensure the hours of non-emergency operation do not exceed 100 hrs/yr. Monthly records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking engine run hours. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual engine run hours and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the process will observe the stack during non-emergency operation and readiness testing for the presence of visible emissions. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.
GEN1 Emergency Generator No. 1 (54 hp)	100 hr/yr	New South will monitor engine run hours monthly to ensure the hours of non-emergency operation do not exceed 100 hrs/yr. Monthly records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking engine run hours. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual engine run hours and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the process will observe the stack during non-emergency operation and readiness testing for the presence of visible emissions. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.

**Appendix G - Proposed Permit Conditions and Monitoring
New South Lumber Company - Bucks Sawmill**

Emission Point ID No.	Operational Limit	Monitoring / Recordkeeping
GEN2 Emergency Generator No. 2 (54 hp)	100 hr/yr	New South will monitor engine run hours monthly to ensure the hours of non-emergency operation do not exceed 100 hrs/yr. Monthly records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking engine run hours. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual engine run hours and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the process will observe the stack during non-emergency operation and readiness testing for the presence of visible emissions. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.
GEN3 Emergency Generator No. 3 (69 hp)	100 hr/yr	New South will monitor engine run hours monthly to ensure the hours of non-emergency operation do not exceed 100 hrs/yr. Monthly records will be kept on-site to show compliance with this limitation.
	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis by tracking engine run hours. The facility will calculate the PM emissions using the lb/hr emission factor multiplied by the actual engine run hours and converted to tons of actual emissions. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.
	20% & 40% Opacity Standards	New South personnel familiar with the process will observe the stack during non-emergency operation and readiness testing for the presence of visible emissions. If visible emissions are detected, corrective measures will be implemented by New South. Records of the daily visible emission observations and any corrective actions taken will be kept on-site.
Facility	Particulate Matter (PM) Compliance Tracking	New South will determine compliance with for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} on a 12-month rolling basis. The facility will calculate and sum the actual PM emissions for each emission unit at the facility in tons of actual emissions within ten (10) days of the end of each calendar month. The total facility-wide 12-month rolling tons must be less than the PSD Significant Emission Rate for Filterable PM, Total PM ₁₀ , and Total PM _{2.5} . The calculated PM emissions will be maintained on-site to demonstrate compliance with this limitation.

APPENDIX H. CITED MATERIALS

**EXCERPT FROM MAJOR SOURCE OPERATING PERMIT RENEWAL
APPLICATION FOR SCOTCH GULF LUMBER, LLC, FULTON
ALABAMA, MARCH 2025**

Table 3.2A. Dry Kiln 4, CDK (Emission Unit 007) Operational Information

Emission Unit	Kiln Potential Throughput ⁽¹⁾ (MMBF/yr)	Burner Capacity (MMBtu/hr)
Dry Kiln 4	100	40

⁽¹⁾Throughput based on maximum capacity of Kiln 4.

Table 3.2B. Dry Kiln 4 Emissions

Pollutant	Emission Factor	Reference	Potential Emissions	
			(lb/hr)	(tpy)
Lumber Drying Emissions				
CO	0.434 lb/MBF	3	4.954	21.70
NO _x	0.276 lb/MBF	3	3.151	13.80
SO ₂	0.025 lb/MMBtu	4	1.000	4.380
PM	0.14 lb/MBF	1	1.598	7.000
PM ₁₀	0.104 lb/MBF	1	1.187	5.200
PM _{2.5}	0.099 lb/MBF	1	1.130	4.950
VOC	4.0 lb/MBF	2	45.66	200.0
Acetaldehyde	0.042 lb/MBF	5	0.4795	2.100
Acrolein	0.006 lb/MBF	5	6.85E-02	0.3000
Formaldehyde	0.0592 lb/MBF	3	0.6758	2.960
Methanol	0.192 lb/MBF	3	2.192	9.600
Methyl Isobutyl Ketone	0.00227 lb/MBF	5	2.59E-02	0.1135
Phenol	0.0103 lb/MBF	5	0.1176	0.5150
Propionaldehyde	0.00292 lb/MBF	5	3.33E-02	0.1460
Toluene	0.0001 lb/MBF	5	1.14E-03	5.00E-03
Xylene	0.0002 lb/MBF	5	2.28E-03	1.00E-02
Total HAPs			3.596	15.75
Wood Burner Greenhouse Gas Emissions⁽¹⁾				
CO ₂	93.80 kg/MMBtu	6	3,752	32,868
CH ₄	7.2E-03 kg/MMBtu	6	0.2880	2.523
N ₂ O	3.6E-03 kg/MMBtu	6	0.1440	1.261
GHG (CO ₂ e)			3,802	33,307
GHG (CO ₂ e) ⁽²⁾			8,382	36,714

⁽¹⁾GHG emissions in kg/hr and metric tons/yr.

⁽²⁾GHG emissions in lb/hr and short tons/yr.

Emission Factor References:

- PM emission factor for direct fired southern yellow pine lumber kiln obtained from a preliminary determination issued by the Georgia EPD for Simpson Lumber Company, LLC. The best available factor for PM is based on test data for Bibler Brothers Lumber Company in Russelville, AR. The PM factors are based on the following information as described in the preliminary determination:
 - PM:**
Filterable PM factor from Bibler Bros. test = 0.0683 lb/MBF
Ratio of condensible to filterable PM (based on unpublished NCASI data) = 1.016
Condensible PM factor = 0.0683 x 1.016 = 0.0694
Total PM = 0.0683 + 0.0694 = 0.14 lb/MBF
 - PM10:**
Filterable PM10 = 50% of filterable PM (based on Permit No. 2421-107-0011-V-02-3 issued by the Georgia EPD to Rayonier Wood Products LLC - Swainsboro, GA)
Total PM10 = [0.0683 x 0.5] + 0.0694 = 0.104 lb/MBF
 - PM2.5:**
Filterable PM2.5 = 87% of filterable PM10 based on AP 42 for wood combustion.
Total PM2.5 = [0.0683 x 0.5 x 0.87] + 0.0694 = 0.099 lb/MBF
- NCASI emission factor. VOC is converted from VOC as C to WPP1 VOC as follows:
VOC (WPP1) = [(VOC as C) x 1.13] + [formaldehyde] + [0.35 x (methanol)]
VOC (WPP1) = (3.5 x 1.13) + 0.0386 + (0.35 x 0.16) = 4.0 lb/mbf
- NCASI emission factor for continuous direct-fired lumber kilns from February 2013 Wood Products Air Emission Factor Database.
- AP 42, Chapter 1.6 Wood Residue Combustion in Boilers, Table 1.6-2.
- NCASI emission factor from February 2013 Wood Products Air Emission Factor Database. Data for these pollutants is not available for direct-fired kilns, therefore, emission factors for indirect-fired lumber kilns is used.
- 40 CFR 98 - Mandatory Greenhouse Gas Reporting Rule Tables C-1 and C-2. CH4 and N2O emissions are multiplied by the global warming potentials found in Table A-1 in order to calculate total GHG emissions.

Table 3.8A. Sawmill Emission Factors

Source	Emission Factors			Units	Control Efficiency (%)	Reference
	PM	PM ₁₀	PM _{2.5}			
Debarker	0.024	0.012	0.006	lb/ton logs	90	1, 4
Mechanical Conveyance to Bark Hog	5.52E-05	2.61E-05	3.95E-06	lb/ton bark	n/a	3
Bark Hog	0.024	0.012	0.006	lb/ton bark	95	1, 4
Bark Truck Loading	5.52E-05	2.61E-05	3.95E-06	lb/ton bark	n/a	3
Log Sawing	0.35	0.175	0.0875	lb/ton logs	95	2, 4
Mechanical Conveyance of Scrap to Chipper	5.52E-05	2.61E-05	3.95E-06	lb/ton chips	n/a	3
Chipper	0.024	0.012	0.006	lb/ton chips	95	1, 4
Mechanical Conveyance of Chips to Chip Truck Bin	5.52E-05	2.61E-05	3.95E-06	lb/ton chips	n/a	3
Chip Truck Loading	5.52E-05	2.61E-05	3.95E-06	lb/ton chips	n/a	3

Emission Factor References:

- 1) Emission factor for Log Debarking from *EPA Region 10 Memorandum: Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014*. Emissions from chipping and bark hogging are assumed to be similar to emissions from log debarking.
- 2) Emission factor for Sawing from *EPA Region 10 Memorandum: Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014*.
- 3) *EPA Region 10 Memorandum: Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014*. The equation used to calculate the emission factors are shown below.
- 4) The control efficiency is the percentage of the process that is enclosed. Debarking, bark hogging, sawing, and chipping occur in areas that are mostly enclosed.

Table 3.8B. Aggregate Handling and Storage Pile Emission Factor Equation

Emission Factor Equation			
$E = k(0.0032) \times [(U/5)^{1.3}] / [(M/2)^{1.4}]$			
Equation Inputs			Source
PM Particle Size Multiplier (k)	0.74	dimensionless	1
PM ₁₀ Particle Size Multiplier (k)	0.35	dimensionless	1
PM _{2.5} Particle Size Multiplier (k)	0.053	dimensionless	1
Mean Wind Speed (U)	8.883	miles/hour	2
Material Moisture Content (M)	50	%	3

Source Notes:

- 1) *EPA Region 10 Memorandum: Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014*.
- 2) Average wind speed for Mobile, AL from TANKS 4.0.9d.
- 3) Estimate for green wood.

Table 3.8C. Aggregate Handling and Storage Pile Emissions Factors

Pollutant	Emission Factor (lb/ton)
PM	5.52E-05
PM ₁₀	2.61E-05
PM _{2.5}	3.95E-06

**INTERIM VOC MEASUREMENT PROTOCOL FOR THE WOOD
PRODUCTS INDUSTRY – JULY 2007**

Interim VOC Measurement Protocol for the Wood Products Industry – July 2007

1.0 Background and Introduction

On July 12, 2006, Mr. William Wehrum, EPA Acting Assistant Administrator, sent a letter to Mr. Timothy G. Hunt, Senior Director, Air Quality Programs, at the American Forest and Paper Association outlining a path forward for the complex issue of measuring and reporting volatile organic compounds (VOCs) in the forest products industry. In this letter, EPA discussed their desire for the forest products industry to report VOCs as the total mass of the individual organic compounds comprising the VOCs to determine major source applicability of federal programs such as NSR and Title V. EPA recognized, however, that the existing test methods fall short of this goal, and that “...*it is impracticable to identify and quantify every compound...*” EPA recognized that it will take some time to develop practical methods to accurately characterize VOC mass in forest products industry emissions. Therefore, EPA endorsed the use of interim VOC measurement approaches to estimate the total mass of VOC emissions while more appropriate methods and additional information are being developed. EPA stated that a “...*reasonable approximation (of total mass) will be sufficient for assessing the applicability of several regulatory programs.*” VOC measurements for existing SIP, NESHAPS, and NSPS requirements and permit limits should continue to use the specified methods.

This interim protocol establishes calculation procedures and emission measurement methods to approximate VOC emissions for determining applicability with federal programs (particularly for NSR and Title V) and to establish consistency across state programs for the forest products industry. For purposes of this protocol, “reasonable approximation” of total VOC mass means expressing VOC as propane and requiring individual measurements of methanol and formaldehyde at sources for which these compounds are significant, as listed in Appendix 1. Historically, the forest products industry has reported its VOC emissions in terms of the mass of carbon atoms in the VOC compounds because the analytical methods measured the VOCs in those terms. For many facilities, therefore, this interim protocol will substantially increase the reported total mass of VOCs to be used in applicability determinations.

2.0 Interim Protocol Overview

In general, VOC is to be calculated as Total Hydrocarbons (THC) expressed as propane plus methanol and formaldehyde expressed as compound, minus adjustments. In specific cases THC may be expressed as alpha-pinene and measurement of formaldehyde and methanol may be omitted. Further details are provided in subsequent sections of this protocol.

In an effort to reduce confusion, VOC as measured and calculated by this protocol is referred to as “WPP1 VOC” (Wood Products Protocol 1 VOC). It is suggested that the industry and sampling companies use this terminology to identify VOC measured by this protocol as differentiated from VOC measured by other protocols.

3.0 THC Measurement

EPA Method 25A shall be used for THC measurement with the following specifications or modifications:

- The THC portion of the VOCs shall be expressed as propane.
- For some facilities, in states where it is the current practice, it may be appropriate to report the THC portion of the VOCs as terpenes (as alpha-pinene) rather than propane.
- The reporting basis for VOC should be clearly identified.

4.0 Methanol and Formaldehyde Measurement

Methanol and formaldehyde may be measured by any of the approved methods listed in the Plywood and Composite Panel MACT (40 CFR 63 Subpart DDDD).

- Appendix 1 provides a list of sources for which formaldehyde and methanol testing must be conducted concurrently with VOC testing. For sources not listed, formaldehyde and methanol testing are not required and WPP1 VOC is the THC as propane measurement minus adjustments for non-VOCs.
- Separate measurement methods may be used for formaldehyde and methanol.

5.0 Response Factors

For the purposes of this document, response factor is defined as the Flame Ionization Analyzer (FIA) response divided by the actual compound concentration, both expressed on the same basis, and expressed as a percentage. For example, an EPA Protocol 1 methane gas with a tag value of 300 ppmvd is measured by a FIA as 315 ppmvd expressed as carbon (315 ppmvd expressed as methane or 105 ppmvd as expressed as propane). The response factor is $315/300 = 105\%$.

This protocol provides the following default response factors:

- Formaldehyde RF = 0%
- Methanol RF = 65%
- Alkanes, alkenes, and arenes RF = 100% (includes methane and ethane)
- Acetone RF = 65%

If desired, instrument specific response factors can be developed and used. Response factors must be developed according to procedures provided in Appendix 3.

Some compounds, such as methane, can have response factors exceeding 100%. For sources for which methane emissions are a significant fraction of the FIA measurement, the testing company may determine a response factor for methane. Similarly, if methanol represents a relatively large fraction of WPP1 VOC, response factor determination may be prudent.

6.0 Treatment of Values Below Detection Limits (Non-Detects)

This section applies to individual compounds required for measurement by this protocol (e.g., methanol) as well as compounds that may be measured as an option. Emissions of these individual compounds may be treated as zero if all of the test runs result in a non-detect measurement and the detection limit is less than or equal to one part per million by volume. Otherwise, non-detect sample runs should be treated as one-half of the detection limit. Compounds measured at concentrations between the detection limit and the practical limit of quantitation should be flagged, but used in calculations as a fully detected value.

7.0 WPP1 VOC Adjustments

This protocol allows users to make adjustments for methanol and non-VOC compounds measured by the FIA. Adjustments are discussed in the following sub-sections. Equations and examples are provided in later sections.

7.1 Adjustments for Methanol

The flame ionization analyzer (FIA) used to measure THC partially measures methanol, resulting in partial “double counting” since methanol is also measured individually according to this protocol. To avoid double-counting, a percentage of the methanol measured independently is subtracted from the THC measurement. The percentage subtracted is either 65% (based on the default response factor provided in Section 5) or a percentage based on an instrument specific response factor. Methanol must be converted to the same basis as THC before subtraction, as shown in Equation 1. This approximately corrects double-counting. The 65% response factor (or instrument specific response factor) represents the amount of methanol measured by the FIA divided by the amount present in the gas stream (both on a carbon basis or common basis).

7.2 Exempt VOCs or non-VOCs

This protocol does not require separate or individual measurement of exempt VOCs or non-VOCs but allows measurement and adjustment for non-VOCs, if desired. Any listed non-VOC compound may be measured independently and the value subtracted from the THC measurement, with appropriate adjustments (proper basis and response factor). An equation and example calculations are provided in later sections of this protocol. Methane, ethane, and acetone are the non-VOCs most commonly sampled in the wood products industry. Methane emissions can sometimes be significant from natural gas fired sources such as direct-natural-gas-fired dryers and RTOs. Typically, acetone and ethane emissions are relatively small, but may vary by source. EPA provides a list of non-VOCs in 40 CFR 51.100(s).

8.0 Calculation of Total VOC Emissions

Total VOC emissions may be calculated by using Equation 1 or by using the “VOC Worksheet.” A spreadsheet for conducting the calculations is also available at www.ncasi.org.

WPP1 VOC emissions are calculated by subtracting (b) from (a) where (a) equals the sum of THC expressed as propane, methanol expressed as methanol (if applicable), and formaldehyde expressed as formaldehyde (if applicable) and (b) equals the sum of methanol and all measured non-VOC compounds, all expressed as propane with each compound multiplied by the appropriate response factor. Units for the calculations should be mass basis (lb/hr or other mass emission rate unit such as lb/ODT or grams/second). Concentration units (e.g., ppm) cannot be used. If, according to Section 3, VOCs are expressed as terpenes, then the term “alpha-pinene” may be substituted for “propane” in Equation 1.

Equation 1

$$\text{VOC} = \left[\begin{array}{l} \left(\text{Method 25A VOC} \right) \\ \left(\textit{expressed as propane} \right) \\ + \left(\text{Methanol} \right) \\ \left(\textit{expressed as methanol} \right) \\ + \left(\text{Formaldehyde} \right) \\ \left(\textit{expressed as formaldehyde} \right) \end{array} \right] - \left(\sum_{i=1}^n \left(\text{RF}_i \times \text{Compound}_i \right) \right) \\ \left(\textit{expressed as propane} \right)$$

Where: RF_i = response factor of i th compound (expressed as a decimal)

Compound_i includes methanol and any individually measured, listed, non-VOC compound but does not include formaldehyde.

Units for all expressions are lb/hr or other mass emission rate unit. Units cannot be concentration units.

Methanol and formaldehyde measurements are required only for sources listed in Appendix 1.

Appendix 1

Dryers
Presses
Board Coolers
Blenders
Formers
Pressurized refiners
Fiber washers

(Includes control devices for the above listed process units. For example, a RTO controlling a dryer would be a listed source.)

Appendix 2

- (1) VOC Worksheet – Page 7
- (2) Sample Calculation – Pages 8-9
- (3) Example VOC Worksheet – Page 10

VOC Worksheet

	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
Measurements – VOC, formaldehyde, and methanol			
lb/hr VOC expressed as propane	1a _____	1a _____	1a _____
lb/hr Formaldehyde expressed as formaldehyde	2b _____	2b _____	2b _____
lb/hr Methanol expressed as methanol	3c _____	3c _____	3c _____
(1a + 2b + 3c) lb/hr	4 _____	4 _____	4 _____
Adjustments - methane, ethane, and methanol			
Methanol expressed as methanol, lb/hr	5a _____	5a _____	5a _____
(5a x 0.458 x RF) lb/hr	6 _____	6 _____	6 _____
Methane expressed as methane, lb/hr	7a _____	7a _____	7a _____
(7a x 0.917 x RF) lb/hr	8 _____	8 _____	8 _____
Ethane expressed as ethane, lb/hr	9a _____	9a _____	9a _____
(9a x 0.976 x RF) lb/hr	10 _____	10 _____	10 _____
Non-VOC compounds other than methane and ethane			
Response factor for non-VOC Compound 1	11a _____	11a _____	11a _____
Molecular weight of non-VOC Compound 1	12b _____	12b _____	12b _____
Number of carbon atoms in non-VOC Compound 1	13c _____	13c _____	13c _____
Mass ER non-VOC Compound 1	14d _____	14d _____	14d _____
[(14d x 13c x 11a x 14.667) ÷ (12b)] =	15 _____	15 _____	15 _____
Response factor for non-VOC Compound 2	16a _____	16a _____	16a _____
Molecular weight of non-VOC Compound 2	17b _____	17b _____	17b _____
Number of carbon atoms in non-VOC Compound 2	18c _____	18c _____	18c _____
Mass ER non-VOC Compound 2	19d _____	19d _____	19d _____
[(19d x 18c x 16a x 14.667) ÷ (17b)] =	20 _____	20 _____	20 _____
Final Calculations			
Enter value from line 4	21 _____	21 _____	21 _____
Enter sum of lines 6, 8, 10, 15 and 20	22 _____	22 _____	22 _____
Subtract line 22 from line 21	23 _____	23 _____	23 _____

Sample Calculation

This example follows the VOC worksheet but provides equations and additional detail. Calculations are provided and discussed, corresponding with the line number on the VOC Worksheet.

Example - A sampling company provides the following results from concurrent sampling at a wood products source:

Compound	Value	Units
VOC as propane (from FIA)	50	lb/hr
Methanol as methanol	10	lb/hr
Formaldehyde as formaldehyde	5	lb/hr
Methane as methane	2	lb/hr
Ethane as ethane	2	lb/hr
Acetone as acetone	2	lb/hr

Acetone, methane, and ethane are listed non-VOCs. The sampling company does not conduct response factor work but uses the default response factors provided in Section 5. Calculate the WPP1 VOC value for this example problem?

Line 4 – This is simply a sum of the mass emission rates of formaldehyde, methanol, and VOCs. 50 lb/hr VOCs as propane + 10 lb/hr methanol as methanol + 5 lb/hr formaldehyde as formaldehyde = 65 lb/hr.

Line 6 – In order for the methanol to be subtracted from the FIA THC measurement, methanol must first be converted to a propane basis. This can be done by using Equation 2 as shown below:

Equation 2

$$\text{Mass}_{\text{VOC expressed as X}} = \text{Mass}_{\text{VOC expressed as Y}} \times \left(\frac{\text{molecular weight of X}}{\text{molecular weight of Y}} \right) \times \left(\frac{\text{number of carbon atoms in compound Y}}{\text{number of carbon atoms in compound X}} \right)$$

For this example converting 10 lb/hr of methanol, measured as methanol, to a mass rate of methanol expressed as propane yields 4.89 lb/hr of methanol expressed as propane as shown below.

$$\begin{aligned} \text{methanol}_{\text{expressed as propane}} &= 10 \text{ lb/hr methanol}_{\text{expressed as methanol}} \times \left(\frac{44}{32} \right) \times \left(\frac{1}{3} \right) \\ &= 4.89 \text{ lb/hr methanol}_{\text{expressed as propane}} \end{aligned}$$

This value requires a second adjustment since less than 100% of the methanol responds in a FIA. The response factor set by this protocol is 65%.

$$0.65 \times 4.89 = 2.98 \text{ lb/hr methanol expressed as propane}$$

Line 8 – Methane must be converted to a propane basis prior to adjustment. Equation 2 may be used as shown below. A response factor adjustment is not needed for methane.

$$\begin{aligned} \text{methane}_{\text{expressed as propane}} &= 2 \text{ lb/hr methane}_{\text{expressed as methane}} \times \left(\frac{44}{16}\right) \times \left(\frac{1}{3}\right) \\ &= 1.83 \text{ lb/hr methane}_{\text{expressed as propane}} \end{aligned}$$

Line 10 – Ethane must be converted to a propane basis prior to adjustment. Equation 2 may be used as shown below. A response factor adjustment is not needed for ethane.

$$\begin{aligned} \text{ethane}_{\text{expressed as propane}} &= 2 \text{ lb/hr ethane}_{\text{expressed as ethane}} \times \left(\frac{44}{30}\right) \times \left(\frac{2}{3}\right) \\ &= 1.95 \text{ lb/hr ethane}_{\text{expressed as propane}} \end{aligned}$$

Lines 15 and 20 - For this example, two non-VOC compounds were included – acetone and methyl acetate. The example assumes the sampling company developed response factors of 65% for both compounds. Equation 2 is used, followed by a response factor correction, as shown below.

Line 15 -

$$\begin{aligned} \text{acetone}_{\text{expressed as propane}} &= 2 \text{ lb/hr acetone}_{\text{expressed as acetone}} \times \left(\frac{44}{58.1}\right) \times \left(\frac{3}{3}\right) \\ &= 1.52 \text{ lb/hr acetone}_{\text{expressed as propane}} \end{aligned}$$

This value requires a second adjustment since the example response factor for acetone is 65%.

$$0.65 \times 1.52 = 0.98 \text{ lb/hr acetone expressed as propane}$$

Line 20 – Not required for this example problem.

Line 21 – This is the sum of VOCs as propane, formaldehyde, and methanol and is copied from Line 4. For this example the value is 65 lb/hr.

Line 22 – The sum of lines 6, 8, 10, 15 and 20 is the sum of the adjustments. $2.98 + 1.83 + 1.95 + 0.98 = 7.75$ lb/hr of VOCs that may be adjusted or subtracted from the total from Line 4.

Line 23 – The adjustments are subtracted from Line 21 to provide the adjusted Total VOC value. $65 - 7.75 = \mathbf{57.3 \text{ lb/hr of VOCs}}$.

Example VOC Worksheet

	Run 1	Run 2	Run 3
Measurements – VOC, formaldehyde, and methanol			
lb/hr VOC expressed as propane	1a <u>50</u>	1a _____	1a _____
lb/hr Formaldehyde expressed as formaldehyde	2b <u>5</u>	2b _____	2b _____
lb/hr Methanol expressed as methanol	3c <u>10</u>	3c _____	3c _____
(1a + 2b + 3c) lb/hr	4 <u>65</u>	4 _____	4 _____
Adjustments - methane, ethane, and methanol			
Methanol expressed as methanol, lb/hr	5a <u>10</u>	5a _____	5a _____
(5a x .458 x 0.65) lb/hr	6 <u>2.98</u>	6 _____	6 _____
Methane expressed as methane, lb/hr	7a <u>2</u>	7a _____	7a _____
(7a x 0.917 x 1.0) lb/hr	8 <u>1.83</u>	8 _____	8 _____
Ethane expressed as ethane, lb/hr	9a <u>2</u>	9a _____	9a _____
(9a x 0.976 x 1.0) lb/hr	10 <u>1.95</u>	10 _____	10 _____
Non-VOC compounds other than methane and ethane			
Response factor for non-VOC Compound 1	11a <u>65%</u>	11a _____	11a _____
Molecular weight of non-VOC Compound 1	12b <u>58.1</u>	12b _____	12b _____
Number of carbon atoms in non-VOC Compound 1	13c <u>3</u>	13c _____	13c _____
Mass ER non-VOC Compound 1	14d <u>2</u>	14d _____	14d _____
[(14d x 13c x 11a x 14.667) ÷ (12b)] =	15 <u>0.98</u>	15 _____	15 _____
Response factor for non-VOC Compound 2	16a _____	16a _____	16a _____
Molecular weight of non-VOC Compound 2	17b _____	17b _____	17b _____
Number of carbon atoms in non-VOC Compound 2	18c _____	18c _____	18c _____
Mass ER non-VOC Compound 2	19d _____	19d _____	19d _____
[(19d x 18c x 16a x 14.667) ÷ (17b)] =	20 _____	20 _____	20 _____
Final Calculations			
Enter value from line 4	21 <u>65</u>	21 _____	21 _____
Enter sum of lines 6, 8, 10, 15 and 20	22 <u>7.75</u>	22 _____	22 _____
Subtract line 22 from line 21	23 <u>57.3</u>	23 _____	23 _____

Appendix 3

Procedure for Response Factor Determination for the Interim VOC Measurement Protocol for the Wood Products Industry

Introduction and Definitions -

The Interim VOC Measurement Protocol for the Wood Products Industry (referred to herein as the Protocol) provides the following default response factors (RFs):

- Formaldehyde RF = 0%
- Methanol RF = 65%
- Alkanes, alkenes, and arenes RF = 100% (includes methane and ethane)
- Acetone RF = 65%

These default response factors may be used in Protocol calculations or, if desired, response factors can be determined for methane, ethane, methanol, and acetone by following the measurement procedures established in this Appendix. EPA Protocol 1 gases with air as a diluent must be used for response factor determination for methane and ethane. If methanol and acetone EPA Protocol 1 gases can be obtained with air as a diluent, they may also be used. Otherwise, methanol and acetone standard gases must be prepared in Tedlar or Teflon sampling bags using air as a diluent. Flame ionization analyzers (FIAs) used to determine response factors must be calibrated with propane in an air diluent. If response factors are determined, then the WPP1 VOC testing must be conducted with the same Flame Ionization Analyzer (FIA) calibrated with the same type hydrocarbon gas used during response factor determination and the gas must be in an air diluent. (If response factors are determined, VOC calibration gases with nitrogen diluents cannot be used either during RF determination or during testing.)

Procedures for preparing challenge gases and determining response factors, other than those provided in this Appendix (e.g. permeation tubes or syringe pumps), may be used if approved by the administrator or regulatory authority.

For the purposes of this document:

Response factor is defined as the flame ionization analyzer (FIA) response divided by the “actual compound concentration”, both expressed on the same basis, and expressed as a percentage. Examples are provided near the end of this Appendix.

Actual compound concentration is defined as the tag or bottle value of the EPA Protocol 1 gas or as the concentration of gas in a Tedlar or Teflon sampling bag. The concentration in the bag is determined by dividing the mass of compound by the volume of total dry gas in the bag and using appropriate conversion factors. Examples are provided near the end of this Appendix.

Challenge gas is defined as the gas used to determine a response factor. Challenge gases must be purchased or prepared as specified in this Appendix.

Determining Response Factors Using EPA Protocol 1 Gases – Prior to introduction of the Protocol 1 challenge gas, the VOC analyzer (Flame Ionization Analyzer or FIA) must be successfully calibrated according to EPA Method 25A procedures with EPA Protocol 1 gases in an air diluent. Once calibrated, the instrument may be challenged with the challenge gas to determine the response factor of the compound in the gas. The challenge-compound concentration should be near the mid range of the FIA span and may not be less than 30% of span or more than 70% of span. For example, a 150 ppmvd methane gas (expressed as methane or as carbon and equivalent to 50 ppmvd expressed as propane) would be an appropriate challenge gas for use on an instrument calibrated with propane with a 0 to 100 ppmvd span (expressed as propane).

The EPA Protocol 1 challenge gas must be introduced to the analyzer in the same manner as the calibration gases were introduced. The gas must be introduced until the response stabilizes and remains stable for at least a five-minute period. One-minute averages or less must be recorded during the five-minute period. Any single one-minute average within the five-minute period must not differ from the overall five-minute-average by more than 10%. The five-minute average concentration of the challenge gas is used to determine the response factor as defined in the Introduction and Definitions section of this document. Documentation of challenge gas introduction and measurement as well as the FIA calibration must be included in the VOC test report.

Determining Response Factors Using Standard Gases Prepared in Tedlar or Teflon Sampling Bags – Methanol and acetone standard gases may be prepared in Tedlar or Teflon sampling bags using the procedures specified in EPA Method 18. Three or more separate bag samples must be prepared. Air must be used as the diluent gas. The mass of methanol or acetone and the volume of gas in the bag must be measured and recorded in the VOC report. Measurements of the compound mass and gas volume must be made by devices traceable to a primary standard and the sampling company must describe how the volume of gas and the mass of compound was measured or determined. The means of introducing the compound into the bag must also be described in the test report.

If the compound is introduced as an aqueous solution the amount of water introduced may not exceed water vapor saturation in the air at 50°F (a moisture content of about 1.2%). The testing company must report the concentration of compound in the water, the amount of solution introduced into the bag, measures taken to assure that all water was converted into water vapor within the bag, the amount of dry air in the bag, and the moisture content of the final gas in the bag. (Because the bag will contain water vapor, the FIA reading will be on a wet basis. The actual compound concentration should also be calculated on a wet basis or both values should be converted to a dry basis before calculation of the response factor. See “Actual Compound Concentration – Example 2” below.)

Prior to introduction of the Teflon or Tedlar bag challenge gas, the VOC analyzer (Flame Ionization Analyzer or FIA) must be successfully calibrated according to EPA Method 25A procedures with EPA Protocol 1 gases in an air diluent. Propane in nitrogen gases cannot be used. Once calibrated, the instrument may be challenged with the bag challenge gas to determine the response factor of the compound in the gas. The challenge-compound concentration should be near the mid range of the FIA span and may not be less than 30% of span or more than 70% of span (measured on an equivalent basis). For example, a 230 ppmvd methanol gas would be appropriate for use on an instrument calibrated with propane with a 0 to 100 ppmvd span (expressed as propane). (The example assumes a 65% response factor for methanol.)

The Tedlar or Teflon sampling bag challenge gas must be introduced to the analyzer in the same manner as the calibration gases. The gas must be introduced until the response stabilizes. Three or more separate bag samples must be introduced. A single bag sample may not be introduced three times. The results from the three or more samples must be averaged and the average used to determine the response factor as defined in the Introduction and Definitions section of this Appendix. The results from any one of the bag samples may not vary from the average by more than 10%. Documentation must be provided to show that the FIA reading stabilized on each of the three bag samples. Additionally, the VOC test report must contain a discussion of the means by which bag challenge gases and FIA calibration gases were introduced to the FIA. Evidence of a successful FIA calibration must also be provided.

Applicability – The response factors developed via the above described procedures may be used in conjunction with the Interim VOC Measurement Protocol for the Wood Products Industry only for the instrument on which the response factors were determined. The response factors determined via these procedures are not valid for the instrument if (1) adjustments have been made that would affect the fuel or air flow rates to the instrument, (2) the instrument has undergone repair, or (3) adjustments to the instrument other than those required for calibrations have been made. Further, the determined response factors may only be used within 30 days of the date on which they were determined. Response factors may be, but are not required to be, determined in the field during the testing event. Response factors determined in the laboratory may be determined under better controlled conditions but response factors determined in the field may be determined under conditions more representative of the testing.

Response factors determined via these procedures are not applicable to FIAs calibrated with nitrogen diluent gases.

Example Calculations Intended to Illustrate the Definitions of “Response Factor” and “Actual Compound Concentration”

Actual Compound Concentration – Example 1

Fifteen milligrams of methanol is introduced into a Tedlar bag containing 45.0 liters of dry air (corrected to 68°F and one atmosphere). The 15 mg of methanol occupies 0.01 liters at standard conditions. The total Tedlar bag volume is 45.01 liters. The actual compound concentration is

$$\left(\frac{15 \text{ mg methanol}}{45.0113 \text{ liters}} \right) \times \left(\frac{24.05 \text{ liters}}{\text{gram - mole}} \right) \times \left(\frac{\text{gram - mole}}{32.04 \text{ grams methanol}} \right) \times \left(\frac{\text{gram}}{1000 \text{ mg}} \right) = 0.00025 = 250 \text{ ppmvd methanol}$$

Actual Compound Concentration – Example 2

Four milliliters of a 5,000 mg/L solution of methanol in water is introduced into a Tedlar bag containing 50 liters of dry air (corrected to 68°F and one atmosphere). The water and 20 mg of methanol

introduced occupy 0.53 and 0.015 liters, respectively. The total Tedlar bag volume is 50.55 liters. The moisture content of the bag is 1.05%. The actual compound concentration is

$$\left(\frac{20 \text{ mg methanol}}{50.545 \text{ liters}} \right) \times \left(\frac{24.05 \text{ liters}}{\text{gram - mole}} \right) \times \left(\frac{\text{gram - mole}}{32.04 \text{ grams methanol}} \right) \times \left(\frac{\text{gram}}{1000 \text{ mg}} \right) = 297 \text{ ppmvw methanol}$$

Note that the methanol concentration is expressed on a wet basis.

Response Factor – Example 3

A FIA calibrated with propane in air measures an EPA Protocol 1 methane in air cylinder gas with a tag value of 150 ppmvd, as methane. The FIA measures the gas as 57 ppmvd, expressed as propane, or 171 ppmvd expressed as methane. The response factor is the measured concentration divided by the actual compound concentration or $171/150 = 114\%$.

Response Factor – Example 4

A FIA calibrated with propane in air measures the Tedlar bag in Example 2 above. The actual compound concentration is 297 ppmvw, expressed as methanol or expressed as carbon. The FIA measures the bag gas as 59 ppmvw, expressed as propane, or 177 ppmvw expressed as carbon. The response factor is the measured compound concentration divided by the actual compound concentration or $177/297 = 59.6\%$.

**EPD RECOMMENDED EMISSION FACTORS FOR LUMBER KILN
PERMITTING IN GEORGIA**

EPD Recommended Emission factors for Lumber Kiln Permitting in Georgia

Below please see the emission factors we have been using lately for Lumber Mill Applications:

Steam Heated Kiln

VOC = 4.0 lbs/Mbf (pounds per thousand board feet)

Formaldehyde = 0.0149 lb/Mbf

Methanol = 0.236 lb/Mbf

Acetaldehyde = 0.0054 lb/Mbf

Direct-fired Kiln

VOC = 4.0 lbs/Mbf

Formaldehyde = 0.0386 lb/Mbf

Methanol = 0.161 lb/Mbf

Acetaldehyde = 0.045 lb/Mbf

The above emission factors are based on recent NCASI test results that are not published yet.

For PM/PM10/PM2.5, we have been using stack tested emission data that were used in Title V Application No. 21615 for West Fraser – Augusta Lumber Mill, which are:

PM = 0.14 lb/Mbf

PM10 = 0.104 lb/Mbf

PM2.5 = 0.099 lb/Mbf

** NOx = 0.28 lb/MM Btu (for Wood fired)

CO = 0.73 lb/MM Btu (for Wood Fired)

** SO2 = 0.025 lb/MM Btu (for Wood Fired)

Total GHG = 209.6 lb/MM Btu (for wood fired)

**Units are understood to be lb/MBF

NOTES ON PM EMISSION FACTORS:

The NCASI emission factors that are used in the emission calculations were initially developed for batch lumber kilns. Since continuous kilns are a new technology, there is limited testing data. No NCASI reviewed testing data currently exists for continuous kilns. The emission factors for a continuous kiln are expected to be equal to or less than that of a batch kiln. The exception to this would be data reviewed regarding particulate matter emissions as part of the preliminary determination for Simpson Lumber Company, LLC (Application Number 20735). Based on a review of the preliminary determination document, the best available emission factors for particulate related emissions are based on tests conducted at Bibler Brothers Lumber Company, Russellville, AR. The Bibler Brothers data is for filterable PM only. The filterable PM emission factor is 0.068 lb/MBF. Condensable PM is based on unpublished data provided by NCASI. NCASI recommends a ratio of Condensable to Filterable PM of 1.016. The Condensable PM emission factor used is therefore 0.069 lb/MBF. Filterable PM10 is assumed to be 50% of filterable PM (based on Permit NO. 2421-107-0011-V-02-3 issued to Rayonier Wood Products LLC-Swainsboro Sawmill). Filterable PM2.5 is assumed to be 87% of PM10 based on AP-42 for wood combustion. All condensable PM is assumed to be PM10 and PM2.5. The resulting PM, PM10, and PM2.5 emission factors are 0.138 lb/MBF, 0.104 lb/MBF, and 0.099 lb/MBF, respectively.

**EXCERPT FROM MAJOR SOURCE OPERATING PERMIT
APPLICATION FOR WEST FRASER – MAPLESVILLE MILL,
ALABAMA, MAY 2014**

Appendix B - Emission Calculations
West Fraser - Maplesville Mill, Alabama

Table B-8. NCASI Emission Factors for HAPs/TAPs from Direct-Fired Batch Kilns (EU008, EU009)
(Fuel: Green Sawdust)

Pollutant	CAS No.	HAP?	Emission Factor	Reference
Acetaldehyde	75-07-0	Yes	0.058 lb/MBF	1
Acetophenone	98-86-2	Yes	2.60E-07 lb/MMBtu	2
Acrolein	107-02-8	Yes	1.90E-04 lb/MMBtu	3
Antimony	7440-36-0	Yes	7.90E-06 lb/MMBtu	4
Arsenic	7440-38-2	Yes	3.70E-06 lb/MMBtu	5
Barium	7440-39-3	No	2.00E-05 lb/MMBtu	5
Benzene	71-43-2	Yes	2.70E-04 lb/MMBtu	5
Benzo(a)pyrene	50-32-8	Yes	2.60E-06 lb/MMBtu	4
Beryllium	7440-41-7	Yes	8.20E-07 lb/MMBtu	2
Bis(2-ethylhexyl)phthalate	117-81-7	Yes	4.70E-08 lb/MMBtu	2
n-Butyraldehyde	123-72-8	No	6.10E-05 lb/MMBtu	5
Cadmium	7440-43-9	Yes	4.70E-06 lb/MMBtu	2
Carbon disulfide	75-15-0	Yes	1.30E-04 lb/MMBtu	5
Carbon tetrachloride	56-23-5	Yes	8.90E-07 lb/MMBtu	5
Chlorine	7782-50-5	Yes	7.90E-04 lb/MMBtu	4
Chlorobenzene	108-90-7	Yes	5.50E-10 lb/MMBtu	2
Chloroform	67-66-3	Yes	3.70E-05 lb/MMBtu	5
Chromium, total	7440-47-3	Yes	6.60E-06 lb/MMBtu	5
Chromium, hexavalent	18540-29-9	Yes	7.30E-06 lb/MMBtu	2, 6
Cobalt	7440-48-4	Yes	4.20E-04 lb/MMBtu	2
Copper	7440-50-8	No	1.30E-05 lb/MMBtu	5
Crotonaldehyde	4170-30-3	No	1.10E-05 lb/MMBtu	5
Cumene	98-82-8	Yes	1.80E-05 lb/MMBtu	5
Dibutylphthalate	84-74-2	Yes	3.30E-05 lb/MMBtu	2
2,4-Dinitrophenol	51-28-5	Yes	2.60E-07 lb/MMBtu	2
2,4-Dinitrotoluene	121-14-2	Yes	9.40E-07 lb/MMBtu	2
Dioxin (as 2,3,7,8-TCDD)	1746-01-6	Yes	8.60E-12 lb/MMBtu	4
Ethylbenzene	100-41-4	Yes	6.80E-06 lb/MMBtu	2
Ethylene dichloride	107-06-2	Yes	2.90E-05 lb/MMBtu	2
Formaldehyde	50-00-0	Yes	0.04 lb/MBF	3
Hexachlorobenzene	118-74-1	Yes	1.00E-06 lb/MMBtu	2
Hexane	110-54-3	Yes	2.90E-04 lb/MMBtu	5
Hydrogen chloride	7647-01-0	Yes	2.30E-03 lb/MMBtu	3
Isopropanol	67-63-0	No	3.00E-03 lb/MMBtu	5
Lead	7439-92-1	Yes	1.77E-05 lb/MMBtu	3
Manganese	7439-96-5	Yes	1.81E-03 lb/MMBtu	3
Mercury	7439-97-6	Yes	5.00E-07 lb/MMBtu	3
Methanol	67-56-1	Yes	0.16 lb/MBF	3
Methyl bromide	74-83-9	Yes	1.50E-05 lb/MMBtu	2
Methyl chloride	74-87-3	Yes	2.30E-05 lb/MMBtu	5
Methyl chloroform	71-55-6	Yes	4.20E-05 lb/MMBtu	5
Methyl ethyl ketone	78-93-3	No	2.40E-08 lb/MMBtu	2
Methyl isobutyl ketone	108-10-1	Yes	0.001 lb/MBF	7
Methylene chloride	75-09-2	Yes	3.50E-04 lb/MMBtu	5
Naphthalene	91-20-3	Yes	2.80E-05 lb/MMBtu	3
Nickel	7440-02-0	Yes	4.80E-06 lb/MMBtu	5
2-Nitrophenol	88-75-5	No	4.20E-08 lb/MMBtu	5
4-Nitrophenol	100-02-7	Yes	1.20E-07 lb/MMBtu	2
PAC	--	No	7.83E-05 lb/ton	8
Pentachlorophenol	87-86-5	Yes	4.80E-08 lb/MMBtu	2
Phenol	108-95-2	Yes	0.022 lb/MBF	1
Phosphorus	7723-14-0	Yes	9.90E-05 lb/MMBtu	2
POM	--	No	2.88E-05 lb/MMBtu	2, 4

Appendix B - Emission Calculations
West Fraser - Maplesville Mill, Alabama

**Table B-8. NCASI Emission Factors for HAPs/TAPs from Direct-Fired Batch Kilns (EU008, EU009)
(Fuel: Green Sawdust)**

Pollutant	CAS No.	HAP?	Emission Factor	Reference
Propionaldehyde	123-38-6	Yes	5.90E-04 lb/MMBtu	3
Propylene dichloride	78-87-5	Yes	3.30E-05 lb/MMBtu	2
Selenium	7782-49-2	Yes	6.20E-06 lb/MMBtu	2
Silver	7440-22-4	No	9.90E-07 lb/MMBtu	5
Styrene	100-42-5	Yes	3.20E-05 lb/MMBtu	5
Tetrachloroethylene	127-18-4	Yes	3.82E-05 lb/MMBtu	9
Thallium	7440-28-0	No	1.90E-06 lb/MMBtu	5
Toluene	108-88-3	Yes	0.0001 lb/MBF	7
1,2,4-Trichlorobenzene	120-82-1	Yes	5.50E-05 lb/MMBtu	2
1,1,2-Trichloroethane	79-00-5	Yes	1.20E-04 lb/MMBtu	2
Trichloroethylene	79-01-6	Yes	3.90E-05 lb/MMBtu	5
Trichlorofluoromethane	75-69-4	No	4.10E-05 lb/MMBtu	5
2,4,6-Trichlorophenol	88-06-2	Yes	2.40E-08 lb/MMBtu	2
Vinyl chloride	75-01-4	Yes	1.80E-05 lb/MMBtu	2
Xylenes	1330-20-7	Yes	2.60E-06 lb/MMBtu	2

1. Lumber-Plywood TRI Workbook 2001, Revision 2, June 2002, by Weyerhaeuser Environmental Technology and Science, as referenced in the May 20120 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
2. Per NCASI TB No. 858, Tables 20A and 20B, February 2003, as published in the Weyerhaeuser air permit application.
3. Per NCASI SARA 313 Guidance - Wood Products - April 2009, as published in the Weyerhaeuser air permit application.
4. Per U.S. EPA's AP-42, Section 1-6, *Wood Residue Combustion in Boilers* (Sept. 2003).
5. Per NCASI TB No. 858, Tables 20A and 20B, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
6. Based on a July 7, 1999 memo from NCDAQ, the chromium VI compounds represented are chromic acid emissions calculated in terms of the chromium VI equivalents, as referenced in the May 2010 Weyerhaeuser Plymouth Lumber Mill Revised Air Permit Application for Energy Project.
7. Per NCASI TB 845, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
8. Per the NCASI publication for Wood Products Facilities, as used in the Title V renewal application for the West Fraser facility in Augusta, Georgia (March 2011, permit 2421-245-0047-V-04-0).
9. Value listed in "Final Report - Revised Air Permit Application for Energy Project," Weyerhaeuser NR Company - Lumber Technologies, Plymouth, NC, May 2010 (Permit # 06389/TT19).

**JULY 7, 1999 MEMO FROM NORTH CAROLINA DEPARTMENT OF
AIR QUALITY RE: CHROMIUM VI COMPOUNDS**

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF AIR QUALITY

July 7, 1999



MEMORANDUM

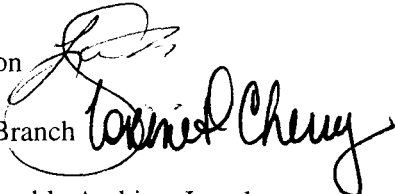
JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

ALAN W. KLIMEK, P.E.
DIRECTOR

TO: Alan Klimek, Director
Keith Overcash, Deputy Director

THROUGH: Lee Daniel, Chief, Technical Services Section

FROM: Lori Cherry, Supervisor, Toxics Protection Branch 

SUBJECT: Updated Guidelines for Implementing Acceptable Ambient Levels (AALs) for Chromium (VI) Compounds

The AALs for chromium (VI) compounds as contained in the current NC Air Toxic Rules differ from the recommendations of the North Carolina Scientific Advisory Board on Toxic Air Pollutants (SAB).¹ The Toxics Protection Branch is working with the Planning Section to revise the current rules to reflect the SAB's recommendations. This memorandum presents revised guidance for implementing AALs for chromium (VI) compounds and supersedes all previous memoranda on chromium (VI) compounds.² *Please be advised that this memorandum outlines a significant departure from prior implementation of the chromium (VI) AALs.*

The SAB recommends two broad categories of chromium (VI) compounds based on the health effects of chromium (VI). The first category encompasses "bioavailable chromate pigments" that are human carcinogens. Calcium chromate and dichromate, strontium chromate and dichromate, and zinc chromate and dichromate are considered "bioavailable chromate pigments." The recommended AAL for this category is 8.3×10^{-8} mg/m³. The second category applies to "soluble chromate compounds" that have been shown to cause nasal tissue ulceration. The SAB defines "soluble chromate compounds" as chromic acid, potassium chromate and dichromate, sodium chromate and dichromate, and ammonia chromate and dichromate. The recommended AAL is 6.2×10^{-4} mg/m³ for this category. In all, thirteen specific chromium VI compounds are grouped under the two broad chromium (VI) categories. Finally, the SAB specifically excludes lead chromate and lithium chromate in its AAL recommendations.

¹ The recommendations of the SAB were submitted in a memorandum to the Environmental Management Commission dated January 11, 1991 and are contained in Attachment B to this document. Dr. Woodhall Stopford, on behalf of the SAB, further clarified their recommendation in a letter addressed to Jeff Hayward on January 29, 1999. This letter is also contained in Attachment B.

² Specifically, this memorandum supersedes the memorandum from Lori Cherry to Thomas Allen dated March 29, 1994 and the memorandum from Lori Cherry to Leslie Biller and Don van der Vaart dated July 11, 1994. This memorandum also supersedes a portion of the memorandum from Julie Woosley and Don Johnson to the Chromium Electroplating MACT Team dated June 20, 1997. The portion of the memorandum that deals with the implementation of chromium (VI) AALs is no longer valid. However, information discussed in the memorandum on other TAPs/HAPs emitted from chromium electroplaters and on last MACT is still valid and is not superseded by this memorandum.

With the exception of lead chromate and lithium chromate, any chromium (VI) compound not specifically listed in the chromium (VI) categories is to be evaluated under a separate AAL for “non-specific chromium (VI) compounds.” The AAL for this category is 8.3×10^{-8} mg/m³, calculated as an annual average.

In summary, three chromium (VI) categories should be listed in the NC Air Toxic Rules. Table 1 presents an overview of the categories, their AALs, and their associated toxic permitting emission rates (TPERs).

Table 1. Overview of Categories of Chromium (VI) Compounds

Chromium (VI) Category	Compounds Included in the Chromium (VI) Category	AAL for Chromium (VI) Category	TPER for Chromium (VI) Category
Bioavailable Chromate Pigments	Calcium chromate (13765-19-0) Calcium dichromate (14307-33-6) Strontium chromate (7789-06-2) Strontium dichromate (77889-06-2) Zinc chromate (13530-65-9) Zinc dichromate (7789-12-0)	8.3×10^{-8} mg/m ³ (annual)	0.0056 lb/yr
Soluble Chromate Compounds	Ammonium chromate (7788-98-9) Ammonium dichromate (7789-09-5) Chromic acid (7738-94-5) Potassium chromate (7789-00-6) Potassium dichromate (7778-50-9) Sodium chromate (7775-11-3) Sodium dichromate (10588-01-9)	6.2×10^{-4} mg/m ³ (24-h)	0.013 lb/day
Non-specific Chromium (VI) Compounds	Any chromium (VI) compound not specified in other categories, with the exception of lead and lithium chromate	8.3×10^{-8} mg/m ³ (annual)	0.0056 lb/yr

Three important considerations must be taken into account when applying the AALs and TPERs:

- 1) The AAL and TPERs are applicable only to the broad chromium (VI) categories, not to the individual compounds listed under each category. In other words, the *sum* of the air concentration or emission rate for each compound within a category needs to be evaluated against the AAL or TPER. This sum cannot exceed the AAL or TPER for the entire category.
- 2) Estimates of emissions and ambient air concentrations should be stated as chromium (VI) equivalents. In other words, only the molecular weight of the chromium (VI) portion of the compound needs to be considered when assessing an AAL or TPER. The use of chromium (VI) equivalents is applicable to *all* categories of chromium compounds.
- 3) Chromium (VI) compounds should not be “double counted” in the three categories. Instead, any chromium (VI) compound should be evaluated under only one category.

Attachment A to this document contains questions and answers that clarify the revised implementation guidance for chromium (VI) compounds.

ATTACHMENT A

Questions and Answers

QUESTIONS AND ANSWERS

- 1) A facility emits 0.01 lbs/year of calcium chromate. Does this facility exceed the TPER for “bioavailable chromate pigments?”

No. The TPERs for the thirteen chromate compounds included in the SAB’s recommendation are applicable only to the chromium (VI) portion of the compounds. Thus, the emission rate of calcium chromate must be adjusted to account for the chromium (VI) portion. The following equation can be used to calculate the emission rate in terms of chromium (VI) equivalents:

Equation 1

$$\begin{aligned} \text{Chromium (VI) Equivalent Emission Rate} &= \frac{\text{Chromium (VI) Molecular Weight}}{\text{Compound Molecular Weight}} \times \text{Emission Rate} \\ &= \frac{52 \text{ g/mole}}{156.1 \text{ g/mol}} \times 0.01 \text{ lbs/yr} \\ &= 0.333 \times 0.01 \text{ lbs/yr} \\ &= 0.00333 \text{ lbs/yr} \end{aligned}$$

As seen in the above example, the emissions in terms of chromium (VI) are below the TPER of 0.0056 lbs/yr for “bioavailable chromate pigments,” and so the facility does not exceed the TPER.

- 2) Air modeling for a facility resulted in an air concentration of potassium chromate estimated as $7.4 \times 10^{-4} \text{ mg/m}^3$ on a 24-hour basis. Does this facility exceed the AAL for “soluble chromate compounds?”

No. The AALs for the thirteen chromate compounds included in the SAB’s recommendation are applicable only to the chromium (VI) portion of the compounds. Thus, the air concentration of potassium chromate must be adjusted to account for the chromium (VI) portion. The following equation can be used to calculate the air concentration in terms of chromium (VI) equivalents:

Equation 2

$$\begin{aligned} \text{Chromium (VI) Equivalent Air Concentration} &= \frac{\text{Chromium (VI) Molecular Weight}}{\text{Compound Molecular Weight}} \times \text{Air Concentration} \\ &= \frac{52 \text{ g/mole}}{194.2 \text{ g/mol}} \times 7.4 \times 10^{-4} \text{ mg/m}^3 \\ &= 0.268 \times 7.4 \times 10^{-4} \text{ mg/m}^3 \\ &= 1.98 \times 10^{-4} \text{ mg/m}^3 \end{aligned}$$

As seen in the above example, the modeled air concentration in terms of chromium (VI) is below the AAL of $6.2 \times 10^{-4} \text{ mg/m}^3$ for “soluble chromate compounds,” and the AAL is not exceeded.

- 3) The updated guidance states that the AALs and TPERs should be evaluated in terms of chromium (VI) equivalents. Equations 1 and 2 show that the chromium (VI) equivalent can be calculated by applying a ratio of 0.333 for calcium chromate and 0.268 for potassium chromate. What are the appropriate ratios for the other chromium (VI) compounds included in the SAB's recommendations?

Table A-1. Ratios for Calculating Chromium (VI) Equivalents

Chromium (VI) Category	Compounds Included in the Chromium (VI) Category	Compound Molecular Weight (g/mol)	Chromium (VI) Ratios
Bioavailable Chromate Pigments	Calcium chromate (CaCrO ₄)	156.09	0.333
	Calcium dichromate (CaCr ₂ O ₇)	206.10	0.406
	Strontium chromate (CrO ₄ Sr)	203.64	0.255
	Strontium dichromate (Cr ₂ O ₇ Sr)	303.62	0.342
	Zinc chromate (ZnCrO ₄)	181.38	0.287
	Zinc dichromate (ZnCr ₂ O ₇)	281.38	0.370
Soluble Chromate Compounds	Ammonium chromate (CrH ₈ N ₂ O ₄)	152.09	0.342
	Ammonium dichromate (Cr ₂ H ₈ N ₂ O ₇)	252.10	0.413
	Chromic acid - H ₂ CrO ₄ CrO ₃ (the anhydrous form)	118 100	0.441 0.52
	Potassium chromate (CrK ₂ O ₄)	194.20	0.268
	Potassium dichromate (Cr ₂ K ₂ O ₇)	294.21	0.354
	Sodium chromate (CrNa ₂ O ₄)	161.97	0.321
	Sodium dichromate (Cr ₂ Na ₂ O ₇)	261.96	0.397

- 4) A facility emits both strontium chromate and calcium chromate. The facility has recently conducted air modeling to determine compliance with the AAL for "bioavailable chromate pigments." The results of the air modeling indicate that the concentration of calcium chromate, in terms of its chromium (VI) equivalent, is 6.5×10^{-8} mg/m³ on an annual basis. The modeled concentration of strontium chromate, in terms of its chromium (VI) equivalent, is 3.2×10^{-8} mg/m³ on an annual basis. Does this facility exceed the AAL?

Yes. The AAL of 8.3×10^{-8} mg/m³ is applicable to the category of "bioavailable chromate pigments." Thus, the modeled concentration of calcium chromate and strontium chromate expressed in terms of chromium (VI) equivalents must be combined to assess the AAL. The sum of the modeled values equals 9.7×10^{-8} mg/m³, which exceeds the AAL for this category.

- 5) A facility emits lead chromate. How should this compound be evaluated?

Lead chromate is not one of the chromium (VI) compounds included in the SAB's recommendations and does not have to be evaluated under the NC Air Toxics rules. However, lead is a regulated compound under EPA's National Ambient Air Quality Standards (NAAQS). Lead accounts for 64.44% of lead chromate. This portion of the compound should be compared with the NAAQS (1.5 $\mu\text{g}/\text{m}^3$ per calendar quarter) to determine compliance for lead. Additionally, both lead and chromium compounds are hazardous air pollutants, and lead chromate may be regulated under certain NESHAPs as a result.

- 6) A facility emits lithium chromate. How should this compound be evaluated?

Lithium chromate is not one of the chromium (VI) compounds included in the SAB's recommendations and does not have to be evaluated under the NC Air Toxics rules. However, chromium compounds are considered a hazardous air pollutant, and lithium chromate may be regulated under certain NESHAPs as a result.

- 7) How should emissions from combustion sources be evaluated under these revisions?

Unless process data are available to indicate otherwise, the chromium emissions from combustion sources should be evaluated as chromic acid (CrO_3) under the "soluble chromate compounds" category. Emissions of chromic acid are first calculated in terms of the chromium (VI) equivalent, using a factor of 0.52 for the anhydrous form. The equivalent emissions are then compared with the TPER for "soluble chromate compounds" to determine compliance.

This recommendation is based on a literature review conducted to better understand the behavior of chromium in combustion reactions. (Attachment C summarizes the literature review.) Measuring specific chromium (VI) compounds present in combustion exhaust is not possible because test methods for hexavalent chromium cannot distinguish between different chromium(VI) compounds. Therefore, theoretical models describing chromium partitioning based on equilibrium data are the best way to determine which chromium (VI) compounds are present. An equilibrium model developed by Kashireninov and Fontijn showed that chromic acid is formed during combustion. According to their model, formation of chromium (VI) compounds - mainly as CrO_3 (g) - reached a maximum of 77% at 1650°K and 400% excess oxygen (Kashireninov and Fontijn, 1998). Although other equilibrium models have shown that different chromium (VI) compounds are dominant, these models considered only individual equilibria and not overall system equilibria, as was done in the Kashireninov and Fontijn model.

- 8) A facility conducted a stack test for a combustion source and reported emissions as total chromium. How should the stack emissions of total chromium be evaluated?

As noted in Question 7, chromium emissions from combustion sources can be reported as chromic acid under the "soluble chromate compounds" category. In this case the facility tests for and reports the total chromium from its combustion source. Therefore, the total chromium measured should practically be considered as chromic acid and compared with the TPER for "soluble chromate compounds" to determine compliance.

This recommendation is based on a literature review conducted to better understand the behavior of chromium in combustion reactions. (Attachment C summarizes the literature review.) Measured and

experimental data indicate that only a fraction of the total chromium in combustion exhaust is chromium (VI). Experimental measurements of chromium (VI) ranged from less than 2% up to about 20%, while stack measurements at electrical utilities showed as much as 34% of total chromium can be chromium (VI). Since formation of chromium (VI) depends on many factors (type of fuel, combustion temperature, presence of compounds, and etc.), developing any kind of chromium (VI) to total chromium ratio is not advised based on the limited data available. Therefore, as a practical matter when source testing is for *total* chromium from combustion sources, the entire result is considered as chromic acid (see Question 7) and compared to the AAL for “soluble chromate compounds,” to be protective of public health. A source test for chromium (VI) compounds remains an option for facilities that may have difficulty applying the *total* chromium results as chromic acid (see Question 9):

- 9) Because test methods for hexavalent chromium cannot distinguish between different chromium(VI) compounds, how should source tests for hexavalent chromium emissions be evaluated?

In some cases, the facility that is testing for chromium (VI) emissions may be able to characterize which species of chromium (VI) are being emitted based on a knowledge of the process. If the facility does not know how to characterize its chromium (VI) emissions, then the emissions should be compared with the AAL and TPER for the “non-specific chromium (VI) compounds” to determine compliance.

- 10) How should chromium emissions from electroplaters using hexavalent chromium baths be evaluated under the SAB’s recommendations?

Although powdered anhydrous chromic acid is used to make hexavalent baths at electroplating facilities, the hydrated form of chromic acid emitted from the baths is more of concern for air quality. Emissions from plating baths are caused by physical rather than chemical processes. When voltage is applied to the bath, hydrogen gas evolves from the bath and causes misting at the liquid surface. The mist is assumed to be composed of hydrated chromic acid (H_2CrO_4) and water in the same ratio as found in the bath. Emissions of H_2CrO_4 from the baths are first calculated in terms of the chromium (VI) equivalents, using the ratio of 0.441 for hydrated chromic acid. The equivalent emissions should be compared with the TPER for “soluble chromate compounds” to determine compliance.

ATTACHMENT B

SAB Recommendations for Chromium (VI) Compounds



THE UNIVERSITY OF NORTH CAROLINA

AT
CHAPEL HILL

The School of Public Health
Department of
Environmental Sciences and Engineering

The University of North Carolina at Chapel Hill
CB# 7400, Rosenau Hall
Chapel Hill, N.C. 27599-7400

January 11, 1991

Gladys VanPelt, PhD
Chair, Air Quality Committee
Environmental Management Commission
Department of Environment, Health,
and Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687

Dear Dr. VanPelt:

Re: Acceptable Ambient Levels for Chromium Compounds

In its meeting on November 15, 1990, the Scientific Advisory Board on Toxic Air Pollutants unanimously adopted a motion to recommend to the Environmental Management Commission that the following listed Acceptable Ambient Levels for chromium compounds be adopted by the Commission:

<u>COMPOUND</u>	<u>EFFECT</u>	<u>AAL (mq/m³)</u>
Bioavailable pigments Chromate and dichromate salts of: Calcium Strontium Zinc	human cancer	8.3 X 10 ⁻⁶
Soluble chromate compounds Chromic acid Chromate and dichromate salts of: Potassium Sodium Ammonium	nose ulceration	6.2 X 10 ⁻⁶
Lithium chromate	none reported	none

The recommended AAL's for chromate and dichromate salts of calcium and strontium are unchanged from those listed in part .1104(b) of the current regulation.

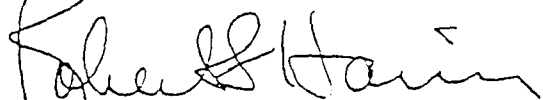
The current regulation does not list chromate compounds of zinc. The new AAL recommended by the Board reflects the recognition of chromate salts of zinc as human carcinogens.

The compounds listed above in the category "soluble chromate compounds" are suspect carcinogens; the AAL calculated for this classification of carcinogens is more lenient than that for their known effect in nose ulceration. Adoption of the more stringent AAL based on nose ulceration is recommended.

No effect for exposure to chromate salts of lithium has been identified; the Board recommends that lithium salts be removed from the AAL list.

Documentation of the Board's recommendations was prepared by Woodhall Stopford, MD. A copy of Dr. Stopford's written review is appended to this letter.

Sincerely yours,



Robert L. Harris, PhD
Chair, Scientific Advisory Board
on Toxic Air Pollutants

Enclosure

cc: Members, Scientific Advisory Board
on Toxic Air Pollutants
Members, EMC Air Quality Committee
Director, DEM
Director, Air Quality Section, DEM

Duke University Medical Center
Division of Occupational and Environmental Medicine
Post Office Box 3834
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Tel: 919-286-5744
FAX: 919-286-5647

January 29, 1999

Jeff Hayward
DEHNR-AIR QUALITY SECTION-TOXICS
Post Office Box 29580
2728 Capital Boulevard
Raleigh, North Carolina 27626-0580
USA

Dear Jeff:

This letter addresses your letter to me of January 7, 1998; your Email to me of December 4, 1998; and our meeting today, all concerning the interpretation of the SAB's recommendation for a change in the chromate AAL from a generic to a compound-specific AAL. We specifically recommended that calcium, strontium and zinc pigments of chromate or dichromate be considered human carcinogens with a summated AAL of 8.3×10^{-8} mg/m³. That is, if a factory emits more than one of these, the emissions of all in this class would be added and the total emissions should meet the AAL for this class.

The second recommendation for compound-specific AALs was for the class made up of chromic acid and soluble potassium, sodium or ammonium salts of chromate or dichromate. We felt that the most protective end point for an AAL for chromium compounds in this class was for nose ulceration resulting in an AAL of 6.2×10^{-4} . This AAL would also protect against cancer risk from exposures to soluble chromium salts in this class. We felt that emissions from one point source of soluble chromium salts in this class should also be summated as we recommended for chromium pigments.

Finally we felt that there should be no separate AAL for lead chromate or lithium chromate, the AALs for lead and lithium being adequate to cover emissions of these compounds.

The SAB expected that these AAL recommendations would replace the generic chromate AAL. If NCDENR wishes to regulate the emissions of other chromate compounds, I suggest that the SAB advise NCDENR as to the appropriate AAL to be developed.

All of these AALs are considered "as chromium" and not as the total emission weight of the specific chromate compound.

Sincerely,



Woodhall Stopford, MD, MSPH
Consulting Toxicologist


ATTACHMENT C

Summary of Literature Review for Chromium (VI)

March 30, 1999

MEMORANDUM

TO: Lori Cherry

FROM: Betty Gatano 

SUBJECT: Literature Review for Chromium (VI) from Combustors

Questions have been raised concerning the way facilities should evaluate chromium emissions from combustors. In response to these questions, a literature review was conducted to better understand the behavior of chromium in combustion reactions¹. An overview of information obtained from the literature review is presented in this memorandum.

Conclusions Based on Literature Review

The literature review showed that only a fraction of the total chromium emitted from combustors is emitted as chromium (VI). Since formation of chromium (VI) depends on many factors (type of fuel, combustion temperature, presence of other compounds, and etc.), developing a chromium (VI) to total chromium ratio is not advised based on the limited data available. Additionally, because test methods for hexavalent chromium cannot distinguish between different chromium (VI) compounds, theoretical models describing chromium VI partitioning based on equilibrium data are the best way to determine which chromium (VI) compounds are formed in combustion reactions. One of the theoretical models considered in this literature review predicted that chromic acid is a dominant chromium (VI) compounds from combustion sources.

Theoretical Data

Current models describing chromium partitioning in combustion data are based on chemical equilibrium. In evaluating theoretical data, limitations in the modeling must be considered. It is important to note that equilibrium conditions may not be achieved in reality because of kinetic rate or mixing limitations. Additionally, any equilibrium prediction is only as good as the thermochemical information available (Linak, et. al, 1996).

Two papers on the equilibrium formation of chromium (VI) products were examined for this memorandum. In the first paper, the effects of chromium (VI) formation in the presence of chlorine and sulfur were examined. Inputs into the model were methane, oxygen, nitrogen, water, chromium, chlorine, and sulfur. The equilibrium model suggests the following (Linak, et. al, 1996):

- 1) In the absence of chlorine and sulfur, chromium (VI) is favored at high temperatures

¹The references reviewed for this memorandum do not represent an exhaustive literature search but include only those sources that were readily available from NCSU.

is emitted as chromium (VI). The average chromium (VI) emitted from the coal-fired utilities is 11% of the total chromium, and the average chromium (VI) from oil-fired utilities was 18% of the total chromium, based on the test data (US EPA, 1998).

References

Huggins, F.E., M. Najih, and G.P. Huffman. 1999. *Direct Speciation in Coal Combustion By-Products by X-Ray Absorption Fine-Structure Spectroscopy*. Fuel. Vol 78, pp. 233-242.

Kashireninov, O.E. and A. Fontijn. 1998. *Modeling of Chromium Combustion in Incineration: Thermochemistry of Cr-C-H-Cl Combustion in Air and Selection of Key Reactions*. Combustion and Flame. Vol 113, pp 498-506.

Linak, W.P., Ryan, J.V., and Wendt, J.O.L. 1996. *Formation and Destruction of Hexavalent Chromium in a Laboratory Swirl Flame Incinerator*. Combustion Science and Technology. Vol 134, pp 243-163.

US EPA. 1998. *Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units -- Final Report to Congress*. Office of Air Quality Planning and Standards, RTP, NC. EPA-453/R-98-004a.

**EXCERPT FROM APPENDIX E OF THE SEPTEMBER 22, 2017 EPA
DOCUMENT SUBJECT: DEVELOPMENT OF A PROVISIONAL
EMISSION CALCULATIONS TOOL FOR THE INCLUSION IN THE
FINAL PCWP ICR**

PCWP	SCC	SCC Level Four	ICR Process Unit Type	Related AP-42 EF to use in absence of more representative data	EF source	EF units	Acetaldehyde	Acrolein	Formaldehyde	Methanol	Phenol	Propion aldehyde
plywood	30700784	Press: Non-Urea Formaldehyde Resin: Hardwood	Hardwood plywood press		No EF for SCC							
plywood	30700785	Press: Urea Formaldehyde Resin: Hardwood	Hardwood plywood press	Hardwood Plywood, press, UF resin	AP-42, Ch 10.5	lb/MSF 3/8			0.0047	0.032	0.011	
plywood	30700791	Hammermill/Chipper: Dry Wood Material	Panel trim chipper	SPW dry trim chipper (chips dry trim from SPW panel saws; process rate = finished board production)	AP-42, Ch 10.5	lb/MSF 3/8				0.0078		
plywood	30700794	Miscellaneous Coating Operations	Miscellaneous coating operation		No EF for SCC							
plywood	30700799	Other Not Classified	Other		No EF for SCC							
lumber	30700841	Lumber Kiln: Indirect-heated: Softwood: Pine Species	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.016	0.18	0.01	0.004
lumber	30700842	Lumber Kiln: Indirect-heated: Softwood: Non-Pine Species	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.016	0.18	0.01	0.004
lumber	30700843	Lumber Kiln: Indirect-heated: Hardwood	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.016	0.18	0.01	0.004
lumber	30700844	Lumber Kiln: Direct-fired: Softwood: Pine Species	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.065	0.18	0.01	0.004
lumber	30700845	Lumber Kiln: Direct-fired: Softwood: Non-Pine Species	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.065	0.18	0.01	0.004
lumber	30700846	Lumber Kiln: Direct-fired: Pressurized	Lumber kiln		NCASI 2014	lb/MBF	0.04	0.004	0.065	0.18	0.01	0.004
MDF	30700909	Refiner/Primary Tube Dryer: Direct Natural Gas-fired: Blowline Blend: Non-Urea Formaldehyde Resin: Pressurized	Primary tube dryer	MDF, tube, direct wood-fired, blowline blend, UF, softwood	AP-42, Ch 10.6.3	lb/ODT			0.86			
MDF	30700910	Refiner/Primary Tube Dryer: Direct Natural Gas-fired: Blowline Blend: Non-Urea Formaldehyde Resin: Pressurized	Primary tube dryer	MDF, tube, direct wood-fired, blowline blend, UF, softwood	AP-42, Ch 10.6.3	lb/ODT			0.86			
MDF	30700911	Refiner/Primary Tube Dryer: Direct Natural Gas-fired: Blowline Blend: Urea Formaldehyde Resin: Mixed	Primary tube dryer	MDF, tube, direct wood-fired, blowline blend, UF, softwood	AP-42, Ch 10.6.3	lb/ODT			0.86			
MDF	30700912	Refiner/Primary Tube Dryer: Direct Natural Gas-fired: Blowline Blend: Urea Formaldehyde Resin: Pressurized	Primary tube dryer	MDF, tube, direct wood-fired, blowline blend, UF, softwood	AP-42, Ch 10.6.3	lb/ODT			0.86			

**PARTICULATE MATTER EMISSION FACTORS FOR NATURAL GAS
COMBUSTION PER EPA'S 2014 NATIONAL EMISSIONS
INVENTORY**

LPG Boiler EFs after ERTAC review version 2, conducted by Roy Huntley, US EPA, 0809.xls: originally, this was called: spreadsheet_LPG emissions factors after ERTAC review session version 2 0808_xls

Efs for natural gas-fired boilers

poll code	value	Units	NUM	Units	DEN
VOC	5.5	LB		E6FT3	EF from AP 42 section 1.4 for boilers
NOX	100	LB		E6FT3	EF from AP 42 section 1.4, for small boiler, uncontrolled
CO	84	LB		E6FT3	EF from AP 42 section 1.4 for boilers
SO2	0.6	LB		E6FT3	EF from AP 42 section 1.4 for boilers
PM10-FIL	0.2	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM10-PRI	0.52	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM25-FIL	0.11	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM25-PRI	0.43	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM-CON	0.32	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls". Used ratio in ss (0.0566) and multiplied by Pmcon in AP42 (5.7)
NH3	0.49	LB		E6FT3	EF from EIIP report Estimating Ammonia Emissions from Anthropogenic Nonagricultural Sources,

PM Efs for natural gas-fired turbines/recip engines, recip engines assumed same as turbines due to lack of data

poll code	value	Units	NUM	Units	DEN
PM10-FIL	0.17	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM10-PRI	0.31	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM25-FIL	0.05	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM25-PRI	0.19	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls".
PM-CON	0.14	LB		E6FT3	PM ef from EPA spreadsheet "Final table with Natural Gas Adjustment factors Nov 21 2006.xls". Used ratio in ss (0.0566) and multiplied by Pmcon in AP42 (4.79)

File entitled "Final table with NG adjustment factors Nov 21 2006.xls" is in this file on another worksheet tab entitled "Final Table with NG Adjustments"

Conversion factors used to convert E6FT3 to E3GAL and E3BBL

value	Units	NUM	Units	DEN	Description
96.75	MMBTU		E3GAL		BTU content for LPG, from AP42 footnotes in section 1.5. table 1.51, arith average of propane and
42	GAL		BBL		Converts gallons to barrels, From AP42 appendix A
1020	MMBTU		E6FT3		BTU content for natural gas

Efs for LPG based on NG AP42 emission factors

poll code	value	Units	NUM	Units	DEN	value	Units	NUM	Units	DEN
VOC	0.521691	LB		E3GAL		21.9110294	LB		E3BBL	
NOX	14.22794	LB		E3GAL		597.573529	LB		E3BBL	
CO	7.967647	LB		E3GAL		334.641176	LB		E3BBL	
SO2	0.056912	LB		E3GAL		2.39029412	LB		E3BBL	
PM10-FIL	0.018971	LB		E3GAL		0.79676471	LB		E3BBL	
PM10-PRI	0.049324	LB		E3GAL		2.07158824	LB		E3BBL	
PM25-FIL	0.010434	LB		E3GAL		0.43822059	LB		E3BBL	
PM25-PRI	0.040787	LB		E3GAL		1.71304412	LB		E3BBL	
PM-CON	0.030353	LB		E3GAL		1.27482353	LB		E3BBL	
NH3	0.046478	LB		E3GAL		1.95207353	LB		E3BBL	

Note the choice of two units

Emission factors (Efs) in box are the ones I recommend. Based on ng AP42 efs and converted to appropriate units for LPG as you can tell by looking at The LPG efs are based on those of natural gas because of the similarities between LPG and ng and the lack of data from LPG sources.

The NOX ef is 1.5 times higher than that of ng due to footnote in table 1.5-1 in section 1.5 of AP42

SCCs that these efs are appropriate for are in a separate Worksheet in this file.

Note that these efs for LPG are recommended for industrial and commercial/institutional use

For residential LPG, I recommend the same as above for all pollutants except for CO and NOX

CO becomes 3.8 lb/E3GAL and Nox becomes 13.4

Roy Huntley, EPA

Huntley.Roy@epa.gov

919 541-1060

Originally the purpose of this worksheet was to document the derivation of the LPG emission factors for boilers and reciprocating engines due to the adjustment we were making regarding the condensable fraction. In March 2012, we added more information regarding documentation

**EXCERPT FROM THE WESTERVELT COMPANY – THOMASVILLE
MILL APPLICATION SUBMITTED IN 2019**

**Appendix B - Detailed Emissions Calculations
The Westervelt Company - Thomasville Mill**

Table B-5. Kiln Operating Parameters

Operating Parameter	Value	Unit
Max Hourly Mill Capacity	40.00	MBF/hr
Max Annual Mill Capacity	350,400	MBF/yr
Max Hourly CDK1 Capacity	13.33	MBF/hr
Max Annual CDK1 Capacity	116,800	MBF/yr
Max Hourly CDK2 Capacity	13.33	MBF/hr
Max Annual CDK2 Capacity	116,800	MBF/yr
Max Hourly CDK3 Capacity	13.33	MBF/hr
Max Annual CDK3 Capacity	116,800	MBF/yr
Annual Operation	8,760	hr/yr

Table B-6. Direct-Fired Kilns Potential Criteria Pollutant Emissions (Wood Drying Emissions)

Pollutant	Emission Factor ¹ (lb/MBF)	CDK1 ²		CDK2 ²		CDK3 ²		Total ³	
		Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Filterable PM	1.30E-02	0.17	0.76	0.17	0.76	0.17	0.76	0.52	2.28
Filterable PM ₁₀	1.30E-02	0.17	0.76	0.17	0.76	0.17	0.76	0.52	2.28
Filterable PM _{2.5}	1.30E-02	0.17	0.76	0.17	0.76	0.17	0.76	0.52	2.28
Condensable PM	9.00E-03	0.12	0.53	0.12	0.53	0.12	0.53	0.36	1.58
Total PM	2.20E-02	0.29	1.28	0.29	1.28	0.29	1.28	0.88	3.85
Total PM ₁₀	2.20E-02	0.29	1.28	0.29	1.28	0.29	1.28	0.88	3.85
Total PM _{2.5}	2.20E-02	0.29	1.28	0.29	1.28	0.29	1.28	0.88	3.85
VOC	4.00	53.3	233.6	53.3	233.6	53.3	233.6	160.0	700.8

1. Filterable PM and condensable PM emission factors are from the recent Georgia Pacific (GP) Talladega Mill application for natural gas fired CDKs. These emission factors were also approved at GP's Mill in Warrenton, GA and represents the average factor plus two standard deviations from August 2012 testing at this site.. All condensable PM is assumed to be PM₁₀ and PM_{2.5}. The VOC emission factor is recommended by the State of GA (EPD) for all direct-fired kilns and has been approved by EPA Region 4.

2. Potential Emissions (lb/hr) = Emission Factor (lb/MBF) x Hourly Fuel Input Capacity (MBF/hr)
Potential Emissions (tpy) = Emission Factor (lb/MBF) x Annual Fuel Input Capacity (MBF/yr) / 2,000 lbs/ton

3. Total emissions represent the sum of CDK1, CDK2, and CDK3 emissions.

Table B-7. Direct-Fired Kilns Potential HAP Emissions (Wood Drying Emissions)

Pollutant	Emission Factor ¹ (lb/MBF)	CDK1 ²		CDK2 ²		CDK3 ²		Total ³	
		Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Acetaldehyde	4.50E-02	0.60	2.63	0.60	2.63	0.60	2.63	1.80	7.88
Acrolein	7.50E-03	0.10	0.44	0.10	0.44	0.10	0.44	0.30	1.31
Formaldehyde	3.86E-02	0.51	2.25	0.51	2.25	0.51	2.25	1.54	6.76
Methanol	0.16	2.15	9.40	2.15	9.40	2.15	9.40	6.44	28.21
Phenol	1.00E-02	0.13	0.58	0.13	0.58	0.13	0.58	0.40	1.75
Total Kiln Drying HAP:								10.48	45.9

1. Emission factors for formaldehyde, methanol, and acetaldehyde are recommended by the State of GA (EPD) for all direct-fired kilns and have been approved by EPA Region 4. Emission factors for acrolein and phenol are from the recent PSD permit application submitted for the Rex Lumber Mill (ADEM Facility No. 210-S006) in Troy, AL.

2. Potential Emissions (lb/hr) = Emission Factor (lb/MBF) x Hourly Fuel Input Capacity (MBF/hr)
Potential Emissions (tpy) = Emission Factor (lb/MBF) x Annual Fuel Input Capacity (MBF/yr) / 2,000 lbs/ton

3. Total emissions represent the sum of CDK1, CDK2, and CDK3 emissions.

EXCERPT FROM THE PSD APPLICATION FOR REX LUMBER MILL

ES-009 -Continuous Dry Kiln (CDK) E - Potential Emissions (PTE)

Potential Production Data

	Production / Throughput Rate	
Continuous Dry Kiln (CDK) E - Potential Production Rate =	14	MBF/hr
	115,000	MBF/yr
Continuous Dry Kiln (CDK) E - Sawdust Gasifier / NG Burner Rating =	35	MMBtu/hr
	0.034	MMscf/hr
Natural gas burner rating (with combination of 35 MMBtu/hr Sawdust Burner)	7	MMBtu/hr
	0.007	MMscf/hr
High Heat Value (HHV) of Natural Gas ¹	1,026	Btu/scf
Annual Hours of Operation	8,760	hrs/yr

1. High heat value for Natural Gas from Table C-1 of EPA's Mandatory Reporting Rule for Greenhouse Gases (40 CFR 98).

Potential Emissions (PTE) -Hazardous Air Pollutant Emission Calculations

Pollutant	CAS Number	Emission Factors			Direct-Fired Lumber Kiln Process / Sawdust Emissions		Direct-Fired Lumber Kiln Process /NG Emissions		Direct-Fired Lumber Kiln Process / Sawdust & NG Emissions		Maximum Emissions	
		Production Based ¹	Wood-fired ²	NG-fired ³	(35 MMBtu/hr - Sawdust Burner)		(35 MMBtu/hr - NG Burner)		(35 MMBtu/hr - Sawdust Burner + 7 MMBtu/hr - NG Burner)			
					(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)		
Acetaldehyde	75-07-0	0.0210	--	--	0.29	1.21	0.29	1.21	2.94E-01	1.21E+00	0.29	1.21
Acetophenone	98-86-2	--	2.21E-06	--	7.73E-05	3.38E-04	--	--	7.73E-05	3.38E-04	7.73E-05	3.38E-04
Acrolein	107-02-8	7.20E-03	--	--	0.11	0.44	0.10	0.41	0.11	0.44	0.11	0.44
Benzene	71-43-2	--	2.82E-04	2.10E-03	9.87E-03	4.32E-02	7.16E-05	3.14E-04	9.88E-03	4.33E-02	9.88E-03	4.33E-02
Bis(2-Ethylhexyl)phthalate (also di-)	117-81-7	--	5.58E-08	--	1.95E-06	8.55E-06	--	--	1.95E-06	8.55E-06	1.95E-06	8.55E-06
Bromomethane (Methyl bromide)	74-83-9	--	4.40E-06	--	1.54E-04	6.75E-04	--	--	1.54E-04	6.75E-04	1.54E-04	6.75E-04
Carbon Disulfide	75-15-0	--	1.50E-04	--	5.25E-03	2.30E-02	--	--	5.25E-03	2.30E-02	5.25E-03	2.30E-02
Carbon Tetrachloride	56-23-5	--	3.06E-06	--	1.07E-04	4.69E-04	--	--	1.07E-04	4.69E-04	1.07E-04	4.69E-04
Chlorobenzene	108-90-7	--	1.99E-05	--	6.97E-04	3.05E-03	--	--	6.97E-04	3.05E-03	6.97E-04	3.05E-03
Chloroform	67-66-3	--	3.06E-06	--	1.07E-04	4.69E-04	--	--	1.07E-04	4.69E-04	1.07E-04	4.69E-04
Chloromethane (Methyl Chloride)	74-87-3	--	3.19E-05	--	1.12E-03	4.89E-03	--	--	1.12E-03	4.89E-03	1.12E-03	4.89E-03
Cumene	98-82-8	--	2.12E-05	--	7.43E-04	3.26E-03	--	--	7.43E-04	3.26E-03	7.43E-04	3.26E-03
Dichlorobenzene	--	--	--	1.20E-03	--	--	4.09E-05	1.79E-04	8.19E-06	3.59E-05	4.09E-05	1.79E-04
Dichloroethane, 1,2- (Ethylene dichloride)	107-06-2	--	3.50E-05	--	1.23E-03	5.37E-03	--	--	1.23E-03	5.37E-03	1.23E-03	5.37E-03
Dichloromethane (Methylene chloride)	75-09-2	--	3.38E-05	--	1.18E-03	5.19E-03	--	--	1.18E-03	5.19E-03	1.18E-03	5.19E-03
Dichloropropane, 1,2- (Propylene dichloride)	78-87-5	--	2.02E-05	--	7.06E-04	3.09E-03	--	--	7.06E-04	3.09E-03	7.06E-04	3.09E-03
Di-n-butyl Phthalate	84-74-2	--	4.00E-05	--	1.40E-03	6.13E-03	--	--	1.40E-03	6.13E-03	1.40E-03	6.13E-03
Dinitrophenol, 2,4-	51-28-5	--	1.57E-07	--	5.50E-06	2.41E-05	--	--	5.50E-06	2.41E-05	5.50E-06	2.41E-05
Dinitrotoluene, 2,4-	121-14-2	--	1.13E-06	--	3.96E-05	1.73E-04	--	--	3.96E-05	1.73E-04	3.96E-05	1.73E-04
Ethylbenzene	100-41-4	--	3.76E-05	--	1.31E-03	5.76E-03	--	--	1.31E-03	5.76E-03	1.31E-03	5.76E-03
Formaldehyde	50-00-0	8.50E-02	--	7.50E-02	1.19	4.89	1.19	4.90	1.19	4.89	1.19	4.90
Hexachlorobenzene	118-74-1	--	1.24E-06	--	4.33E-05	1.89E-04	--	--	4.33E-05	1.89E-04	4.33E-05	1.89E-04
Hexane	110-54-3	--	3.46E-04	1.80E+00	1.21E-02	5.30E-02	0.06	0.27	2.44E-02	1.07E-01	6.14E-02	2.69E-01
Hydrogen Chloride	7647-01-0	--	1.33E-04	--	4.66E-03	2.04E-02	--	--	4.66E-03	2.04E-02	4.66E-03	2.04E-02
Methanol	67-56-1	2.40E-01	--	--	3.36	13.80	3.36	13.80	3.36	13.80	3.36	13.80
MIBK	108-10-1	1.20E-03	5.34E-04	--	3.55E-02	1.51E-01	0.02	0.07	3.55E-02	1.51E-01	3.55E-02	1.51E-01
Naphthalene	91-20-3	--	9.76E-06	6.10E-04	3.41E-04	1.50E-03	2.08E-05	9.11E-05	3.46E-04	1.51E-03	3.46E-04	1.51E-03
4-Nitrophenol	100-02-7	--	1.13E-07	--	3.95E-06	1.73E-05	--	--	3.95E-06	1.73E-05	3.95E-06	1.73E-05
Pentachlorophenol	87-86-5	--	5.38E-08	--	1.88E-06	8.24E-06	--	--	1.88E-06	8.24E-06	1.88E-06	8.24E-06
Phenol	108-95-2	2.70E-02	--	--	0.38	1.55	0.38	1.55	3.78E-01	1.55E+00	0.38	1.55
POM	Various	--	1.27E-04	6.98E-04	4.43E-03	1.94E-02	2.38E-05	1.04E-04	4.44E-03	1.94E-02	4.44E-03	1.94E-02
Propionaldehyde	123-38-6	3.50E-03	--	--	4.99E-02	2.05E-01	4.90E-02	2.01E-01	4.99E-02	2.05E-01	4.99E-02	2.05E-01
Styrene	100-42-5	--	1.85E-05	--	6.47E-04	2.83E-03	--	--	6.47E-04	2.83E-03	6.47E-04	2.83E-03
Tetrachloroethene (Tetrachloroethylene, Perchloroethylene)	127-18-4	--	2.95E-05	--	1.03E-03	4.53E-03	--	--	1.03E-03	4.53E-03	1.03E-03	4.53E-03
Toluene	108-88-3	1.20E-04	4.40E-06	3.40E-03	1.83E-03	7.58E-03	1.80E-03	7.41E-03	1.86E-03	7.68E-03	1.86E-03	7.68E-03
Trichloroethane, 1,1,1- (Methyl Chloroform)	71-55-6	--	4.72E-05	--	1.65E-03	7.23E-03	--	--	1.65E-03	7.23E-03	1.65E-03	7.23E-03
Trichloroethene (Trichloroethylene)	79-01-6	--	2.39E-05	--	8.36E-04	3.66E-03	--	--	8.36E-04	3.66E-03	8.36E-04	3.66E-03
Trichlorophenol, 2,4,6-	88-06-2	--	3.31E-07	--	1.16E-05	5.08E-05	--	--	1.16E-05	5.08E-05	1.16E-05	5.08E-05
Vinyl Chloride	75-01-4	--	2.21E-05	--	7.73E-04	3.38E-03	--	--	7.73E-04	3.38E-03	7.73E-04	3.38E-03
Xylene	1330-20-7	2.40E-04	6.26E-06	--	3.58E-03	1.48E-02	3.36E-03	1.38E-02	3.58E-03	1.48E-02	3.58E-03	1.48E-02

FUEL SILO CYCLONE EMISSIONS DATA

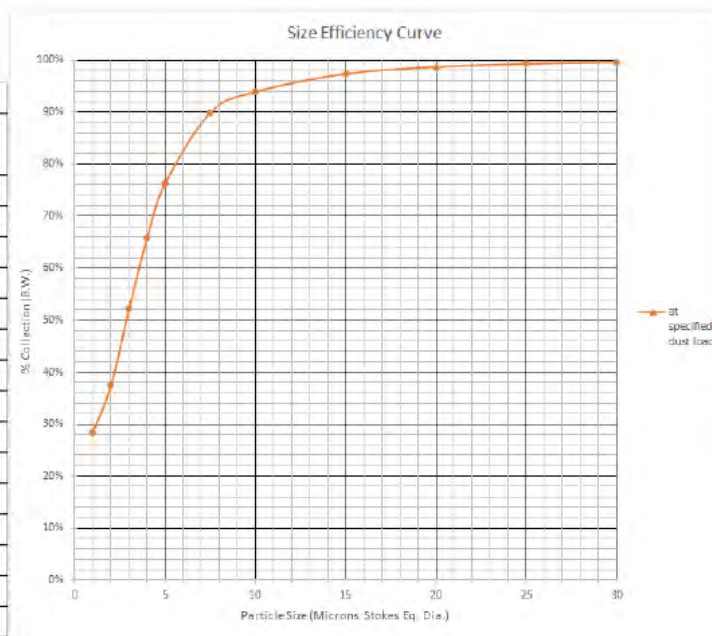
To whom it may concern:

Western Pneumatics was asked to provide emissions data for a green sawdust high pressure system where 45 ton/hr of green sawdust is conveyed to a cyclone receiver using a dilute phase pneumatic conveying system. Using historical data, our typical capture efficiency of the cyclone receiver for like processes is 99.97% on a mass basis. The data below represent a typical collection efficiency and particle size distribution for this type of process.

Based on the 99.97% efficiency and a 45 ton/hr process flow rate, the expected emissions from the receiver cyclone will be 27 lb/hr.

Collection Efficiency

Particle Size (Microns in Stokes Eq.)	Efficiency (At Specified Dust Load)
1	28.43%
2	37.46%
3	52.18%
4	65.86%
5	76.31%
7.5	89.84%
10	93.87%
15	97.34%
20	98.66%
25	99.25%
30	99.55%
40	99.81%
50	99.91%
75	99.98%
100	99.99%



Assumed PSD

Particle Size (Microns- Stokes Eq. Dia.)	Fraction Less Than (By Weight)
5	0.00001
10	0.0002
15	0.0017
20	0.00648
30	0.00932
40	0.0206
60	0.0323
100	0.05
150	0.07
254	0.1
1000	0.25
17780	0.999999

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Report of Results: MVA16167

Particle Size Distribution Measurement

Prepared for:

**Alliance Source Testing
214 Central Circle SW
Decatur, AL 35603**

Respectfully Submitted by: _____

**Jake Mosely, M.S.
Research Scientist**

18 September 2025

Report of Results: MVA16167

Particle Size Distribution Measurement

Introduction

This report presents data originally reported by MVA on 21 February 2025.

Methods

The sample was prepared for analysis in accordance with MVA SOP 310, "Sample Preparation Methods for Total Particle Sizing Using Microscopical Techniques."

The particle size distribution was measured in accordance with MVA SOP 327, "Automated Particle Size Analysis Using the JEOL JSM-IT700HR and Thermo Scientific Noran System 7" using a JEOL JSM-IT700HR field emission scanning electron microscope equipped with a Thermo Scientific Noran System 7 x-ray analysis system. The particle size data is presented in terms of estimated mass. The assumption has been made that the particles are all of similar density, and therefore, the particle volume distribution is equivalent to the particle mass distribution.

Results

The size distribution of the particulate from the analyzed sample, by mass percentage and down to 0.5 micrometer, is shown in Table 1.

Table 1. MVA 16167. Percentage of Particles in Various Average Diameter Ranges by Mass of Particles

MVA Sample Number	AM0211
Client ID	M5 Filter - 25666-A
Average Diameter Range (μm)	Mass %
0.5 - 1	0.2
>1 - 2.5	1.2
>2.5 - 5	3.3
>5 - 7.5	4.8
>7.5 - 10	4.3
>10 - 75	86.3
>75	nd

nd = not detected

**EPA REGION 10 MEMO, PARTICLE MATTER POTENTIAL TO EMIT
EMISSION FACTORS FOR ACTIVITIES AT SAWMILLS, MAY 2014**




UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140


OFFICE OF
AIR, WASTE, AND TOXICS

MAY 08 2014

MEMORANDUM

SUBJECT: Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country

FROM: Dan Meyer, Environmental Engineer 
Air Permits & Diesel Unit

THRU: Donald A. Dossett, P.E., Manager 
Air Permits & Diesel Unit

TO: Permit File

EPA Region 10 has compiled the attached list of particulate matter (PM – CAA § 111 pollutant, PM₁₀ and PM_{2.5} – criteria pollutants) emission factors (“EFs”) for use in determining the potential emissions, more commonly referred to as potential to emit (“PTE”), for activities at sawmills, excluding boilers, located in Pacific Northwest Indian Country.¹ The EFs are presented in units appropriate for the particular activity. PTE generally represents the maximum capacity of a source to emit a pollutant under its physical and operational design taking into consideration restrictions that are federally enforceable. While PM, PM₁₀ and PM_{2.5} PTE are all used to determine applicability of the Compliance Assurance Monitoring program and Prevention of Significant Deterioration construction permit program, only PM₁₀ and PM_{2.5} are employed to determine applicability of the Title V operating permit program.²

The Federal Air Rules for Reservations (“FARR”) limit particulate matter emissions from applicable activities at sawmills. The rules and the rationale for not employing them to determine PTE are as follows: (a) 20 percent opacity limit (40 CFR § 49.124) – lack of a correlation between opacity and particulate matter emissions, (b) requirements for limiting fugitive emissions (40 CFR § 49.126) – lack of a correlation between compliance with requirements and particulate matter emissions, (c) non-combustion stack 0.1 grain per dry standard cubic foot PM emission limit (40 CFR § 49.125) – resultant PTE would be unrealistically high as we assume that an unreasonable amount of wood residue is exhausted to atmosphere rather than recovered for sale or combustion in on-site boiler.

There are no other federal regulations beyond the FARR that limit particulate matter emissions from activities addressed by this memorandum. Under the circumstances, it is appropriate to employ the EFs presented in the attachment to estimate PTE, unless a more representative (e.g. site-specific) EF is available.

¹ Activities include log bucking and debarking, sawing, lumber drying, mechanical and pneumatic conveyance of wood residue, wind erosion of wood residue piles and traffic along paved and unpaved roads.

² October 16, 1995 EPA memorandum entitled, “Definition of Regulated Pollutant for Particulate Matter for Purposes of Title V”

EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014

EF Reference No.	Emissions Generating Activity ¹	PM ² EF	PM ₁₀ % of PM	PM ₁₀ EF	PM _{2.5} % of PM	PM _{2.5} EF	Units
1, 2, 3, 4	Log Bucking ³	0.035	50	0.0175	25	0.00875	lb/ton log
1, 2, 3, 5	Log Debarking ³	0.024	50	0.012	25	0.006	lb/ton log
1, 2, 3, 6	Sawing ³	0.350	50	0.175	25	0.0875	lb/ton log
1, 3, 7	Lumber Drying - Resinous Softwood Species ⁴	0.02	100	0.02	100	0.02	lb/mbf
1, 3, 7	Lumber Drying - Non-Resinous Softwood Species ⁵	0.05	100	0.05	100	0.05	lb/mbf
1, 2, 3, 8	"Drop" of "wet" material ⁵ from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."	0.00075	N/A	0.00035	N/A	0.00005	lb/bdt material
1, 2, 3, 8	"Drop" of "dry" material ⁵ from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."	0.0015	N/A	0.0007	N/A	0.0001	lb/bdt material
1, 3, 9	Pneumatically convey material ⁶ through medium efficiency cyclone to bin	0.5	85	0.425	50	0.25	lb/bdt material
1, 3, 9	Pneumatically convey material ⁶ through high efficiency cyclone to bin	0.2	95	0.19	80	0.16	lb/bdt material
1, 3, 9	Pneumatically convey material ⁶ through cyclone to bin. Exhaust routed through baghouse.	0.001	99.5	0.000995	99	0.00099	lb/bdt material
1, 3, 9	Pneumatically convey material ⁶ into target box	0.1	85	0.085	50	0.05	lb/bdt material
1, 2, 10	Wind Erosion of Pile	0.38	50	0.19	25	0.095	ton/acre-yr
1, 2, 11	Paved Roads	Emission factors based upon site-specific parameters.					lb/VMT
1, 2, 12	Unpaved Roads	Emission factors based upon site-specific parameters.					lb/VMT

Acronyms

bdt: bone dry ton
 mbf: 1000 board foot lumber
 VMT: vehicle mile traveled

¹ If any activity occurs within a building, reduce the PM, PM₁₀ and PM_{2.5} emission factor ("EF") by 100 percent (engineering judgement) as emissions struggle to escape through doorways and other openings. If an activity's by-products are evacuated pneumatically to a target box, cyclone or bag filter system, then only the associated downstream conveyance emissions are counted.

² PM refers to the CAA § 111 pollutant generally measured using EPA Reference Method 5 to determine the filterable fraction of particulate matter. "Particulate matter" is a term used to define an air pollutant that consists of a mixture of solid particles and liquid droplets found in the ambient air. PM does not include a condensable fraction.

³ EF for log bucking, debarking and sawing are expressed in units of "lb/ton log" in the table above. The EF can be expressed in units of "lb/mbf" lumber as follows:

$$\text{lb/mbf} = (\text{lb PM/ton log}) \times (\text{ton}/2000 \text{ lb}) \times (\text{LD lb/ft}^3) \times (\text{LRF bf lumber/ft}^3 \text{ log}) \times (1000 \text{ bf/mbf})$$

where "LD" stands for log density and "LRF" stands for log recovery factor

• LD values are species-specific and are provided by The Engineering ToolBox and are listed at http://www.engineeringtoolbox.com/weight-wood-d_821.html

• LRF value of 6.33 bf/ft³ log is specific to softwood species of the Pacific Coast East. See Section 2 of Appendix D to Forest Products Measurements and Conversion Factors with Special Emphasis on the U.S. Pacific Northwest. College of Forest Resources, University of Washington. 1994. See http://www.ruraltech.org/projects/conversions/briggs_conversions/briggs_append2/appendix02_combined.pdf

⁴ Douglas Fir, Engelmann Spruce, Larch, Lodgepole Pine, Ponderosa Pine and Western White Pine

⁵ White Fir, Western Hemlock and Western Red Cedar

⁶ The "material" in this entry refers to bark, hogged fuel, green chips, dry chips, green sawdust, dry sawdust, shavings and any other woody by-product of lumber production.

No.	EF Reference																								
1	Although this activity may be subject to the FARR visible emissions limit of 20% opacity (40 CFR § 124(d)), the limit was not further considered in deriving an emission factor due to the lack of a correlation between opacity and particulate matter emissions.																								
2	Although this activity may be subject to the FARR requirements for limiting fugitive particulate matter emissions (40 CFR §126), those requirements were not further considered in deriving an emission factor due to lack of a correlation between compliance with requirements and particulate matter emissions.																								
3	Although this activity may be subject to the FARR stack PM emission limit of 0.1 gr/dscf (40 CFR § 125(d)(3)), that limit was not further considered in deriving an emission factor because the resultant PTE would be unrealistically high.																								
4	For PM, PM ₁₀ , and PM _{2.5} EF, apply engineering judgement to estimate that log bucking emissions are one-tenth sawing emissions. EPA has stated that log bucking is normally a negligible source of fugitive PM emissions. See page 2-125 of Assessment of Fugitive Particulate Emission Factor for Industrial Processes, EPA-450/3-78-107, September 1978. The document can be downloaded from internet at http://nepis.epa.gov/Simple.html by entering EPA publication number. For sawing emissions details, see Reference No. 3 below.																								
5	<ul style="list-style-type: none"> For PM EF, see Table 2-47 of Assessment of Fugitive Particulate Emission Factor for Industrial Processes, EPA-450/3-78-107, September 1978. See also Table 2-59 of Technical Guidance for Controls of Industrial Process Fugitive Particulate Emissions, EPA-450/3-77-010, March 1977. Both documents can be downloaded from internet at http://nepis.epa.gov/Simple.html by entering EPA publication number. EPA revoked the PM EF from WebFIRE on January 1, 2002. See detailed search results for SCC 3-07-008-01 (include revoked factors) at http://cfpub.epa.gov/webfire/index.cfm?action=fire.detailedSearch For PM₁₀ and PM_{2.5} EF, apply engineering judgement to estimate that (a) PM₁₀ emissions are one-half PM emissions and (b) PM_{2.5} emissions are one-half PM₁₀ emissions. 																								
6	<ul style="list-style-type: none"> Sawing consists of the following cumulative activities: breaking the log into cants and flitches with a smooth edge, breaking cant further down into multiple flitches and/or boards, taking the flitch and trim off all irregular edges to leave four-sided lumber and trimming to square the ends. For PM EF, see Table 2-47 of Assessment of Fugitive Particulate Emission Factor for Industrial Processes, EPA-450/3-78-107, September 1978. See also Table 2-59 of Technical Guidance for Controls of Industrial Process Fugitive Particulate Emissions, EPA-450/3-77-010, March 1977. Both documents can be downloaded from internet at http://nepis.epa.gov/Simple.html by entering EPA publication number. EPA revoked the PM EF from WebFIRE on January 1, 2002. See detailed search results for SCC 3-07-008-01 (include revoked factors) at http://cfpub.epa.gov/webfire/index.cfm?action=fire.detailedSearch For PM₁₀ and PM_{2.5} EF, apply engineering judgement to estimate that (a) PM₁₀ emissions are one-half PM emissions and (b) PM_{2.5} emissions are one-half PM₁₀ emissions. 																								
7	<ul style="list-style-type: none"> For PM EF, see ODEQ ACDP Application Guidance AQ-EF02 (4/25/00). Douglas fir is a resinous softwood species and western hemlock is a non-resinous softwood species. For PM₁₀ and PM_{2.5} EF, apply engineering judgement to estimate that all PM emitted is organic aerosols and fully PM₁₀ and PM_{2.5} emissions. 																								
8	<p>• See Section 13.2.4 of EPA's AP-42, November 2006 at http://www.epa.gov/ttn/chieff/ap42/ch13/final/c13s0204.pdf. Apply Equation 1 on page 13.2.4-4 to estimate emissions resulting from material drops as follows: $E [\text{lb PM/ton}] = (k) \times (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$</p> <p style="text-align: center;"><u>Wet Material Drop</u></p> <table border="1"> <thead> <tr> <th>Particulate</th> <th>k</th> <th>0.0032</th> <th>$(U/5)^{1.3}$</th> <th>$(M/2)^{1.4}$</th> <th>$\frac{\text{lb PM}}{\text{ton}}$</th> </tr> </thead> <tbody> <tr> <td>PM</td> <td>0.74</td> <td></td> <td></td> <td></td> <td>0.00075</td> </tr> <tr> <td>PM₁₀</td> <td>0.35</td> <td>0.0032</td> <td>6.6693</td> <td>21.0552</td> <td>0.00035</td> </tr> <tr> <td>PM_{2.5}</td> <td>0.053</td> <td></td> <td></td> <td></td> <td>0.00005</td> </tr> </tbody> </table> <p>The following conservative assumptions were made in applying Equation 1:</p> <p style="margin-left: 40px;">Mean wind speed (U) = 15 miles per hour $(U/5)^{1.3} = 6.66930$</p> <p style="margin-left: 40px;">Material moisture content (M) = 34 percent. Value based upon observations $(M/2)^{1.4} = 21.05520$</p> <p>Note:</p> <ul style="list-style-type: none"> • Mean wind speed of 15 mph is a reasonable upper bounder estimate. • Moisture content of 34 percent for "wet" material is based upon observation that average moisture content (dry basis) of green douglas fir lumber (common to the Pacific Northwest) is 51 percent as recorded prior to lab scale kiln VOC emissions testing conducting by Oregon State University's Mike Milota and organized in Microsoft Excel workbook entitled, "EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012." 51 percent moisture content (dry basis) is equivalent to 34 percent moisture content (wet basis) as illustrated below: <p style="margin-left: 40px;">MCD = MCW / (1-MCW); where MCD: moisture content dry basis MCW: moisture content wet basis</p> <p style="margin-left: 40px;">$0.51 = MCW / (1 - MCW)$ $0.51 - (0.51)(MCW) = MCW$ $(1.51)(MCW) = 0.51$ MCW = 0.34, or 34 percent</p>	Particulate	k	0.0032	$(U/5)^{1.3}$	$(M/2)^{1.4}$	$\frac{\text{lb PM}}{\text{ton}}$	PM	0.74				0.00075	PM ₁₀	0.35	0.0032	6.6693	21.0552	0.00035	PM _{2.5}	0.053				0.00005
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PM _{2.5}	0.053				0.00005																				

Dry Material Drop

Particulate	k	$(U/5)^{1.3}$	$(M/2)^{1.4}$	lb PM ton
PM	0.74			0.0015
PM ₁₀	0.35	0.0032	6.6693	0.0007
PM _{2.5}	0.053			0.0001

The following conservative assumptions were made in applying Equation 1:

Mean wind speed (U) = 15 miles per hour
 $(U/5)^{1.3} = 6.6693$
 Material moisture content (M) = 13 percent
 $(M/2)^{1.4} = 10.5552$

Note:

- Mean wind speed of 15 mph is a reasonable upper bounder estimate.
- Moisture content of 13 percent for "dry" material is based upon observation that typical moisture content (dry basis) of kiln-dried lumber is 15 percent as recorded during lab scale kiln emissions testing conducting by Oregon State University's Mike Milota and organized in Microsoft Excel workbook entitled, "EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, December 2012." 15 percent moisture content (dry basis) is equivalent to 13 percent moisture content (wet basis) as illustrated below:
 $MCD = MCW / (1 - MCW)$; where
 MCD: moisture content dry basis
 MCW: moisture content wet basis

 $0.15 = MCW / (1 - MCW)$
 $0.15 - (0.15)(MCW) = MCW$
 $(1.15)(MCW) = 0.15$
 $MCW = 0.13$, or 13 percent

9	<ul style="list-style-type: none"> • For PM EF, see Oregon Department of Environmental Quality (ODEQ) Wood Products Emission Factors, AQ-EF02 Revised 08/01/11. http://www.deq.state.or.us/qaq/permit/acdp/docs/AQ-EF02.pdf • For PM₁₀ and PM_{2.5} EF, see ODEQ Wood Products Emission Factors - PM₁₀/PM_{2.5} Fractions, AQ-EF03 Revised 08/01/11. http://www.deq.state.or.us/qaq/permit/acdp/docs/AQ-EF03.pdf
10	<ul style="list-style-type: none"> • For PM EF, see last row of Table 11.9-4 on page 11.9-11 of Section 11.9 of EPA's AP-42, July 1998 at http://www.epa.gov/ttn/chieff/ap42/ch11/final/c11s09.pdf. • For PM₁₀ and PM_{2.5} EF, apply engineering judgement to estimate that (a) PM₁₀ emissions are one-half PM emissions and (b) PM_{2.5} emissions are one-half PM₁₀ emissions.
11	See Equation 1 on page 13.2.1-4 of Chapter 13.2.1 of AP-42, January 2011 at http://www.epa.gov/ttn/chieff/ap42/ch13/final/c13s0201.pdf
12	See Equation 1a on page 13.2.2-4 of Chapter 13.2.2 of AP-42, November 2006 at http://www.epa.gov/ttn/chieff/ap42/ch13/final/c13s0204.pdf

**MANUFACTURER'S DATA FOR PLANER MILL CYCLONE -
BAGHOUSE DUST SYSTEM FROM AIR SYSTEM MFG.**



August 6, 2025

Canfor Southern Pine
Axis, A.L.

SUBJECT: DUST SYSTEM RE-VISION'S – ASM # 25-354

Gentlemen:

We are pleased to submit our proposal for the design, fabrication, rentals and installation of the subject DUST SYSTEM RE-VISION'S for CANFOR SOUTHERN PINE in AXIS, ALABAMA as specified following and in accordance to our ASM proposal drawing # 25-354.

BY AIR SYSTEMS MFG. OF LENOIR, INC.

PLANERMILL CYCLONE, FEEDER, FANS & CONVEYORS

Furnish and install one (1) new style design ASM-168 High Efficiency Cyclone as required with new steel on existing structural support, complete with explosion vents, access door and 110V bindicator as needed.

Furnish and install one (1) new Clarke's CFV-48 rotary feeder complete with 20-horsepower motor and 110V zero motion sensor as required beneath the material outlet of the new ASM cyclone as needed.

Furnish and install two (2) new Bio-Mass 60M Smart Conveyors complete with 30 & 15-horsepower motors, 110V level sensors, zero-motion sensors, deluge systems and supports as required located underneath the cyclone and feeder to convey material to the customers existing dust bin as needed.

Furnish and install materials as required to connect the outlet of the new cyclone to the inlet of the new conveyor, via the new feeder on existing platform as needed.

Furnish and install materials as required to connect the outlet of the new conveyor to the customers existing bin, via the new conveyor and existing bin platform with steel modifications as needed.

Furnish and install two (2) new Phelps WRM 640 Fan Packages complete with 400-horsepower direct-drive motors each, unitary sub-base, drain plug, flexible coupling, grounding shaft and insulated bearings for VFD capabilities. **(VFD REQUIRED BY OTHER)**

Furnish and install materials as required to connect the air discharge outlet of the new cyclone unit to the air inlet of the new fans via the new ASM boot-tee and fitting as needed.

Furnish and install materials as required to connect the inlet of the new cyclone unit to the main system as needed.

FILTER RELOCATION, FEEDER, ABORT VALVE, DAMPER & CONVEYOR

Furnish rentals, labor and materials to remove customers MAC filter from the Iron Mtn. location to relocate to the Axis, A.L location as required and install with existing support steel and 110V bindicator as needed.

Furnish and install one (1) new Boulware Super Can Upgrade Kit as required in the customers existing MAC filter complete with new cleaning head manifold powered by 3/4-horsepower motor, new reverse air cleaning fan with 40-horsepower motor, new tube sheet, new cages and bags as needed.

Furnish and install materials as required to connect the air discharge outlet of the new fan units to the air inlet of the customers existing filter unit via the new stands, isolation damper and abort valve as needed.

Furnish and install one (1) new Clarke's 60" Isolation Damper as required prior to the customers filter inlet complete with structural steel support, access platform, safety ladders and 110V limit switch.

Furnish and install one (1) new Clarke's CP-55 Hi-Speed Abort Gate as required prior to the isolation damper inlet complete with structural steel support, access platform, safety ladders and 110V actuator.

Furnish and install one (1) new Clarke's 25 X 30 ERO Feeder complete with 5-horsepower motor as required beneath the customers existing filter as needed.

Furnish and install one (1) new Bio-Mass 18S Smart Conveyor complete with 3-horsepower motor, 110V level sensors, zero-motion sensor, deluge system and supports as required located underneath the filter and feeder to convey material to the new bin conveyor as needed.

SILO TARGET BOXES & VENTS

Furnish and install two (2) new ASM Target Boxes of AR-15 Hard-Ox material atop the existing silos as required to allow the existing high-pressure line to be connected via support steel as needed.

Furnish and install three (3) new silo vent lids as required atop each of the two (2) existing silos as needed.

DESIGN DATA

NEW CYCLONE

Brand:	ASM, New Style Design
Size:	H-168
Type:	High Efficiency
Gauge:	7-GA, 3/16" HRS
Capacity:	99,090 CFM
Cyclone Loss:	6" Static Pressure
Feeder Size:	Clarke's CFV-48
Feeder Motor:	20 Horsepower Motor

NEW FANS

Fans Brand and Size:	Phelps, WRM, 640
Motor Sizes:	Two (2) Direct-Drive 400 Horsepower motors
Collection Air:	99,090 CFM
Design Velocity:	5,600 FPM
Design Fan Speed:	1,185 RPM
Design Static Pressure:	26" WG
Design Brake Horsepower:	339 BHP

NEW SMART CONVEYORS

Brand and Size:	Biomass, "M" & "S" Series, Two (2) 60" & One (1) 18" Wide
Gauge:	¼" Sidewalls & ¾" Wear strips
Type:	Bottom-Drag, Paddle Conveyor, Rake "Clawed" Paddles
Linear Velocity:	130, 130 & 66 Ft./Min.
Motors:	One (1) 30, one (1) 15 & one (1) 3 Horsepower Motors
Chain Type:	55%, 23% & 6% Chain Workload Approximately
Capacity:	91%, 91% & 23 % Full
Deluge System:	2" Pipe Connections

EQUIPMENT SPECIFICATIONS

Cyclone:	ASM, high efficiency, 7-gauge black metal, painted per customers color code, welded construction, bolted structural steel support, access door, explosion vents and 110V indicator for detection in cone.
2) Fans:	Phelp's, painted per customers color code, radial bladed wheel, shaft guard, unitary base, 2) 400-HP motors, direct drive, flexible coupling, insulated bearings and grounding shaft for VFD, (VFD BY OTHER) , drain plug and 110V zero motion switches.
3) Smart Conveyors:	Biomass, painted per customers color code, External maintenance, Interchangeable wear strips W/O opening conveyor or breaking chains, Direct Drive, Bottom drag, chute plug detector sensors, zero speed for tail (110v), sealed inspection doors, (17) 2" deluge system connections, deflagration panels, 30, 15 & 3-HP motors and structural support steel.

TIME AND MATERIAL EXTRA TO CONTRACT

The following can be furnished by Air Systems Mfg. of Lenoir, Inc., but is not included in the above proposed or quotation due to the uncertainty of the amount or the exact requirements:

Any repairs or revisions to customer supplied equipment not specified.

Any extra trips required to project site due to delays in customer equipment delivery or scheduling conflicts beyond our control.

THE FOLLOWING WORK WILL BE REQUIRED BY OTHERS

Required local or state permits, fees, and P. E. stamped drawings.

Receive and store our equipment and material shipments to job site.

Furnish an area inside building to store and assemble our piping.

All electrical wiring and controls.

Concrete foundations and anchoring
(The anchor bolt layout will be furnished by Air Systems Mfg. of Lenoir, Inc.)

Fire detection / suppression equipment.

Spark detection / suppression equipment.

Any revisions to roof steel required to support our piping.

Furnish access to a forklift.

Dispose of present piping and equipment removed and not to be reused.

WARRANTIES

Machined Rotary Feeders:	-One (1) year from date of shipment.
Material Handling Fans:	-One (1) year from date of shipment.
Smart Conveyors:	-One (1) year from date of shipment.
Isolation Damper:	-One (1) year from date of shipment.
Abort Valve:	-One (1) year from date of shipment.



September 2, 2025

Canfor Southern Pine, Inc. – Axis, A.L – *Southern Yellow Pine Wood Dust Emissions*

ASM Efficiency Guarantee For Canfor Southern Pine, Inc. – Dust System

To whom it may concern,

Air Systems Mfg. of Lenoir, Inc. has processed the sawdust to enter the collector for Canfor Southern Pine, Inc. and determined the following below:

Sieve and Moisture Analysis of the Wood Dust (Southern Yellow Pine)

Sample Test Results - Screen Size and as received Sieve and Moisture Analysis:

- On No. 40 = 97.6%
- On No. 70 = 1.6%
- On No. 100 = 0.4%
- On No. 200 = 0.4%
- o In Pan = 0.0%
- Approx. Moisture = 17.8%
- **(Can vary & cause different results)**

Air Systems Mfg. of Lenoir, Inc. guarantees material will emit less than shown:

- PM @ 3.382 lb./hr & 0.004 gr/dscf
- PM 2.5 @ 3.382 lb./hr & 0.004 gr/dscf
- PM 10 @ 3.382 lb/hr & 0.004 gr/dscf

Very truly yours,

AIR SYSTEMS MFG. OF LENOIR, INC.

Nelson Miller

**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
WOOD INDUSTRY POST CONTROL FACTORS FOR LOG SAWING**

Wood Industry

Emission Factors

Date: 1/12/2005

I am planning on posting this report on the NSR web site sometime in February, but I'd like your comments before I do. If you could, please review and make any comments you want. I'd appreciate it. I promise to take them in a construction manner.

Again, your help in this review will be appreciated.

Wood Industry

Emission Factors

Date: 1/12/2005

Log Debarking (sawmills):	0.024 lb PM/ton of logs debarked (1)
	0.011 lb PM ₁₀ /ton of logs debarked (11)
Controls:	
Wet storage of logs prior to debarking	95% (1)
Hooding, vent to cyclone	80% (1)
Hooding, vent to fabric filter	99% (1)
Enclosure, partial	95%
Enclosure, total	100% (1)
Log Soaking Vats (plywood):	2.80 lbs VOC/hr for 1200 ft ² vat (10)
	Assume emissions are linear with surface area and adjust factor by ratio of 2.80/1200 to new emission rate/ surface of new vats
Controls:	None
Sawing (cross-cut/rip saw):	0.35 lb PM/ton logs sawed (1)
	0.20 lb PM ₁₀ /ton of logs sawed (11)
Controls:	
Wet material	0%
Hooding, vent to cyclone	80% (1)
Hooding, vent fabric filter: outlet grain loading 0.01 gr/dscf	
Partial Enclosure	85%
Full Enclosure	90%
Enclosed by building	90%
Building under negative pressure	100%
Chipping Operation:	0.024 lb PM/ton of wood chipped (1)
(assumed to be the same as debarking)	0.011 lb PM ₁₀ /ton of wood chipped (11)
Controls:	
Hooding, vent to cyclone	80% (1)
Hooding, vent to fabric filter	99% (1)
Enclosure, partial	95%
Enclosure, total	100% (1)

NEASI - National Council for Air
And Stream Improvement

**Sawdust Pile Loading, Unloading, and
Storage (sawmills):**

	1.00 lb PM/ton of sawdust handled (1)
	0.36 lb PM ₁₀ /ton of sawdust handled (11)
Controls:	
Wet suppression	50% (1)
Enclosure (silo) fabric filter	0.01 gr/dscf outlet grain loading
Enclosure (silo) cyclone	80% (1)
Telescopic tubes	75% (1)

Wood Waste Collection System (with Sanding Operations): (Controlled - Large
Diameter Cyclones)

	5.0 lb PM/ton handled (7)
	2.4 lb PM ₁₀ /ton handled (11)

Wood Waste Collection System (without Sanding Operations): (Controlled - Large
Diameter Cyclones)

	2.0 lb PM/ton handled (7)
	1.20 lb PM ₁₀ /ton handled (11)

Wood Waste Storage Bin Vent:

	1.00 lb PM/ton wood waste stored (1)
	0.58 lb PM ₁₀ /ton wood waste stored (11)
Controls:	
Fabric filter	0.01 gr/dscf outlet grain loading

Wood Waste Storage Bin Loadout: 2.00** lb PM/ton wood waste loaded out (1)

** This factor was included in AP-42 from 7/79 until the Fifth Edition of AP-42 issued in 1/1995. The footnote said the emission factors were based on engineering judgment from plant visits prior to 1979.

Emission factors for the loadout of grain is recommended because these emissions were evaluated and reported from 1994-1997, and grain and wood waste have similar properties. Both are made of cellulose fiber. Both contain internal moisture. Wood chips will be large in size. Grain would produce more fines as it is handled. Therefore, the emission factor for loadout of grain would be more conservative than emissions from the loadout of wood waste.

...	0.086 lbs PM/ton of wood waste loadout (14)
..	0.029 lbs PM ₁₀ /ton of wood waste loadout (14)

Controls: Fabric filter 0.01 gr/dscf outlet grain loading
 Telescopic tubes 75% (1)
 Enclosure (3-sided) 60% (1)
 Enclosure, vent to cyclone 80% (1)
 Enclosure, vent to fabric filter 99% (1)

Hardboard Sander: 0.03 lb PM₁₀/MSF 1/8 (2)
 (Controlled - Fabric Filter)

Controls: Fabric filter 0.01 gr/dscf outlet grain loading

Plywood Cutting and Sanding: 0.1 lb PM₁₀/ft² (6)
 (Uncontrolled)

Controls: Fabric filter 0.01 gr/dscf outlet grain loading

Planner: 2.25 lb PM/ton processed (13)
 0.9 lb PM₁₀/ton processed (13)

Controls: Fabric filter 0.01 gr/dscf outlet grain loading
 99.5 % for Cyclone
 99.9% for baghouse

Wood Chip Stockpile (VOC). Due to unavailability of emission factors or techniques, EPA Region 6 and OAQPS EPA Headquarters agree with the TCEQ position that these emissions are in the biogenics category of the air emissions inventory, and therefore, it is not necessary to regulate these emissions. This letter was received from EPA - Region 6 on February 26, 1996. When emission factors are developed, then VOC emissions from stockpiles can be estimated.

Several Sections in AP-42 under Chapter 10 - Wood Products Industry that were revised in 2002 states that both VOCs and condensable PM are primarily compounds evaporated from the wood. Quantities emitted are dependent on wood species, dryer temperature, fuel used, and other factors including season of the year, time between logging and processing, and wafer storage time.

Lumber Drying Kilns: (3)

New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Pine Species: 0.62 - 1.11 lbs VOC (as Propane) / MBF (3)
..... or 1.86 - 3.32 lbs VOC (as Carbon) / MBF (3)

Non-Pine Species: 0.04 - 0.27 lbs VOC (as Propane) / MBF (3)
..... or 0.12 - 0.81 lbs VOC (as Carbon) / MBF (3)

PINE WOOD:

Southern Yellow Pine - Texas 1.11 lbs VOC (as propane)/MBF
..... or 3.32 lbs VOC (as Carbon)/MBF

Southern Yellow Pine - Arkansas 0.79 lbs VOC (as propane)/MBF
..... or 2.36 lbs VOC (as Carbon)/MBF

White Pine 0.76 lbs VOC (as propane)/MBF
..... or 2.26 lbs VOC (as Carbon)/MBF

Sugar Pine 0.69 lbs VOC (as propane)/MBF
..... or 2.07 lbs VOC (as Carbon)/MBF

Ponderosa Pine 0.62 lbs VOC (as propane)/MBF
..... or 1.86 lbs VOC (as Carbon)/MBF

NON-PINE WOOD:

Coastal Douglas Fir 0.12 lbs VOC (as propane)/MBF
..... or 0.34 lbs VOC (as Carbon)/MBF

Douglas Fir Sapwood 0.07 lbs VOC (as propane)/MBF
..... or 0.21 lbs VOC (as Carbon)/MBF

Douglas Fir Heartwood 0.27 lbs VOC (as propane)/MBF
..... or 0.81 lbs VOC (as Carbon)/MBF

Hemlock (evergreen tree) 0.08 lbs VOC (as propane)/MBF
..... or 0.24 lbs VOC (as Carbon)/MBF

White Fir 0.19 lbs VOC (as propane)/MBF
..... or 0.57 lbs VOC (as Carbon)/MBF

Grand Fir 0.18 lbs VOC (as propane)/MBF
..... or 0.53 lbs VOC (as Carbon)/MBF

Cedar 0.04 lbs VOC (as propane)/MBF
..... or 0.12 lbs VOC (as Carbon)/MBF

Redwood 0.04 lbs VOC (as propane)/MBF
 or 0.12 lbs VOC (as Carbon)/MBF

NOTE: To calculate hourly emission rates, divide the total emissions by the hours in the drying cycle. Research has shown that VOC emissions increase in a near constant rate during the drying cycle until near the end of the cycle.

Example:

Southern Yellow Pine from Texas has a drying cycle of approximately 33 hours.
 Redwood has a drying cycle of approximately 325 hours.
 Cedar has a drying cycle of approximately 15 hours.
 Coastal Douglas Fir has a drying cycle of approximately 22 hours.
 Hemlock has a drying cycle of approximately 39 hours.
 Grand Fir has a drying cycle of approximately 44 hours.
 White Fir has a drying cycle of approximately 53 hours.

Hardwood: 0.26 lbs VOC (as Carbon)/MBF (12)
 0.09 lbs VOC (as Propane)/MBF (12)

Plywood Veneer Dryers (steam fired):

Southern Pine 2.94 lbs VOC/10,000 ft² of 3/8 inch veneer(8)
 3.70 lbs Condensibles/10,000 ft² of 3/8 inch veneer (8)
 Larch 0.19 lbs VOC/10,000 ft² of 3/8 inch veneer(8)
 4.14 lbs Condensibles/10,000 ft² of 3/8 inch veneer (8)
 Douglas Fir Sapwood 0.45 lbs VOC/10,000 ft² of 3/8 inch veneer(8)
 4.64 lbs Condensibles/10,000 ft² of 3/8 inch veneer (8)
 Douglas Fir Heartwood 1.30 lbs VOC/10,000 ft² of 3/8 inch veneer(8)
 3.18 lbs Condensibles/10,000 ft² of 3/8 inch veneer (8)

Bark Boiler:

For emission information, see EPA RACT/BACT/LAER Clearinghouse:

Lime Kiln in Paper Mill:

MACT, Subpart MM 0.064 gr PM/dscf @ 10% O₂ (Existing)(9)
 0.010 gr PM/dscf @ 10% O₂ (New)(9)

For emission information, see EPA RACT/BACT/LAER Clearinghouse.

Paper Machines:

For emission information, see EPA RACT/BACT/LAER Clearinghouse:

VOC *****
Controls Work practices and use of low-VOC additives

Recycle Fiber (Paper):

For emission information, see EPA RACT/BACT/LAER Clearinghouse:

VOC *****
Controls None

Kraft Pulping:

Digester Relief and Blow Tank 0.03 lbs H₂S/ ADTP (5)
..... 1.2 lbs TRS/ADTP (5)

Brown Stock Washer 0.02 lbs H₂S/ADTP (5)
..... 0.4 lbs TRS/ADTP (5)

Multiple Effect Evaporator 1.1 lbs H₂S/ADTP (5)
..... 0.1 lbs TRS/ADTP (5)

Recovery Boiler and Direct Evaporator

MACT, Subpart MM 0.044 gr PM/dscf @ 8% O₂ (Existing)(9)
..... 0.034 gr PM/dscf @ 8% O₂ (New)(9)
..... 0.025 lbs HAP (measured as methanol)/ton of BLS (New)(9)

Venturi Scrubber 7 lbs SO₂/ADTP (5)
..... 11 lbs CO/ADTP (5)
..... 12 lbs H₂S/ADTP (5)
..... 3 lbs TRS/ADTP (5)

ESP 7 lbs SO₂/ADTP (5)
..... 11 lbs CO/ADTP (5)

..... 12 lbs H₂S/ADTP (5)
..... 3 lbs TRS/ADTP (5)

Smelt Dissolving Tank - Scrubber

MACT, Subpart MM 0.20 lbs PM/ton BLS (Existing)(9)
..... 0.12 lbs PM/ton BLS (New)(9)
..... 0.02 lbs H₂S/ADTP (5)
..... 0.02 lbs TRS/ADTP (5)

Turpentine Condenser 0.01 lbs H₂S/ADTP (5)
..... 0.5 lbs TRS/ADTP (5)

Plywood:

General Emission Factors can be found in AP-42, Section 10.5 Plywood Manufacturing (01/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source at subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 768 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part I - Plywood.

Oriented Strandboard (OSB):

General Emission Factors can be found in AP-42, Section 10.6.1 Waferboard/Oriented Strandboard Manufacturing (3/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 772 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part V - Oriented Strandboard (OSB).

Louisiana-Pacific Corporation submitted an application on 9/9/2004 for their OSB Mill in Carthage (Permit 26002), Panola County, Texas. Results of stack sampling from 1997 to 2000 for the Carthage and Jasper OSB Mills can be found in Appendix C.

Particleboard:

General Emission Factors can be found in AP-42, Section 10.6.2 Particleboard Manufacturing (6/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 771 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part IV - Particleboard.

Medium Density Fiberboard:

General Emission Factors can be found in AP-42, Section 10.6.3 Medium Density Fiberboard Manufacturing (8/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 770 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part III - Medium Density Fiberboard.

Hardboard and Fiberboard:

General Emission Factors can be found in AP-42, Section 10.6.4 Hardboard and Fiberboard Manufacturing (9/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 773 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part VI - Hardboard and Fiberboard.

Engineered Wood Products:

Engineered wood products include laminated veneer lumber (LVL), laminated stand lumber (LSL), parallel stand lumber (PSL), I-joints, and glue-laminated beams (glulam). General Emission Factors can be found in AP-42, Section 10.9 Engineered Wood Products Manufacturing (11/2002). A list of organic compounds that may be emitted from this facility is included in this Section. New, reconstructed, or existing affected source are subject to MACT, Subpart DDDD - Plywood and Composite Wood Products (**).

Additional VOC emissions information can be found in NCASI Technical Bulletin No. 769 (January 1999) - Volatile Organic Compound Emissions from Wood Products Manufacturing Facilities - Part II - Engineered Wood Products.

** MACT, Subpart DDDD establishes national compliance options, operating requirements, and work practice requirements for HAPs emitted from plywood and composite wood products (PCWP) manufacturing facilities that is a major source of HAPs. PCWP include, but are not limited to, plywood, veneer, particleboard, oriented strandboard, hardboard, fiberboard, medium density fiberboard, laminated strand lumber, laminated veneer lumber, wood I-joists, kiln-dried lumber, and glue-laminated beams. A PCWP manufacturing facility is a facility that manufactures plywood and/or composite wood products by bonding wood material (fibers, particles, strands, veneers, etc.) or agricultural fiber, generally with resin under heat and pressure, to form a structural panel or engineered wood product.

Compliance options and operating requirements can be met by one of three ways, and these requirements can be found in Tables 1A, 1B, and 2 in Appendix B:

- (a) Production-based compliance,
- (b) Compliance options for add-on control systems, or
- (c) Emissions averaging compliance option (for existing sources only).

Work practice requirements can also be found in a Table 3 in Appendix B.

New and reconstructed facilities must comply by September 28, 2004. Existing facilities, or area source, must be in compliance by October 1, 2007.

Potential Federal Standards:

40 CFR 60, Subpart BB - Standards of Performance for Kraft Pulp Mills.

40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

40 CFR 60, Subpart Ka - Standard of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced after May 18, 1978, and Prior to July 23, 1984.

40 CFR 60, Subpart Kb - Standard of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984.

40 CFR 63, Subpart S - Pulp and Paper Industry.

40 CFR 63 MM - Chemical Recovery Combustion Sources at Kraft, Sulfite, and Stand-Alone Semicheical Pulp Mills.

40 CFR 63 DDDD - Plywood and Composite Wood Products (PCWP).

40 CFR 63 DDDD - Industrial, Commercial and Institutional Boilers and Process Heaters.

Acronyms:

ADTP = Air Dry Ton of Pulp (10% moisture)

BDTP = Bone Dry Ton of Pulp (0% moisture)

BLS = Black Liquor Solids

H₂S = Hydrogen Sulfide

MBF = 1000 board feet

MDTP = Machine Dry Ton of Pulp (6% moisture)

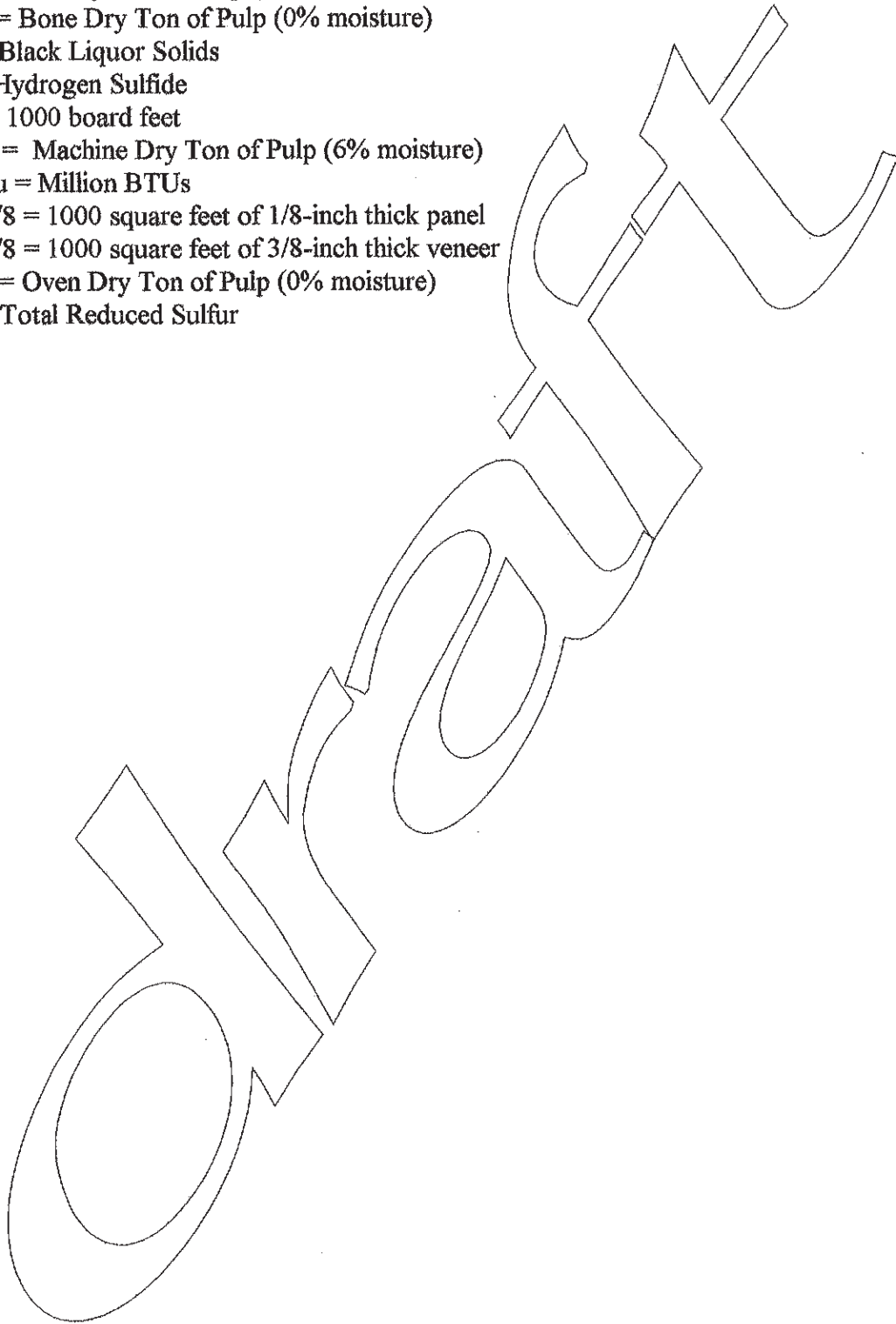
MMBtu = Million BTUs

MSF 1/8 = 1000 square feet of 1/8-inch thick panel

MSF 3/8 = 1000 square feet of 3/8-inch thick veneer

ODTP = Oven Dry Ton of Pulp (0% moisture)

TRS = Total Reduced Sulfur



References:

- (1) Fugitive Dust Control Technology, Noyes Data Corporation, 1983 and AP-42, Section 10.4.3 Fugitive Emission Factors, Table 10.4-2 (7/1979)
- (2) AP-42, Section 10.6.4 Hardboard and Fiberboard Manufacturing, Table 10.6.4-7 (9/2002)
- (3) NCASI Technical Bulletin No. 718 - July 1996
- (4) Inland Paperboard and Packaging Inc's application received 3/1/2004
- (5) AP-42, Section 10.2 Chemical Wood Pulping, Table 10.2-1 (9/1990)
- (6) AP-42, Section 10.3 Plywood Veneer, Table 10.3-1 (2/1980)
- (7) AP-42, Section 10.4 Woodworking Waste Collection Operations, Table 10.4-1 (2/1980)
- (8) AP-42, Section 10.3 Plywood Veneer and Layout Operations, Table 10.3-2 (2/1980)
- (9) MACT, Subpart MM - Chemical Recovery Combustion Sources at Kraft, Soda, Sulfitte, and Stand-Alone Semicemical Pulp Mills
- (10) Test data from the Corrigan Plywood facility
- (11) Idaho DEQ Emission Factor Guide for Wood Industry (1/8/1997)
- (12) Appendix D of report by MRI to EPA for the development of MACT, Subpart DDDD (6/9/2000)
- (13) EPA document "Emission Inventory Improvement Project", Volume II, Chapter 14, P. 14A-133.
- (14) AP-42, Section 9.9.1 Grain Elevators and Processes, Table 9.9.1-1

**EPA CERTIFICATES OF CONFORMITY FOR EMERGENCY FIRE
PUMP AND GENERATORS**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

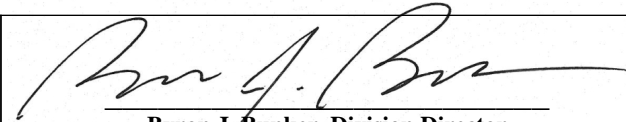
OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Generac Power Systems, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: PGNXB04.52NN-015

Effective Date:
08/03/2022

Expiration Date:
12/31/2023


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
08/03/2022

Revision Date:
N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: PGNXB04.52NN
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
Emission Standards :
Part 90 Phase I
NMHC + NOx (g/kW-hr) : 13.4
HC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

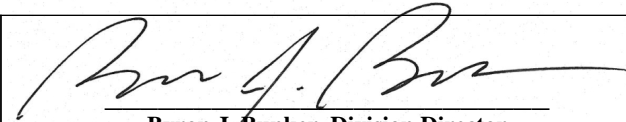
OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Generac Power Systems, Inc.
(U.S. Manufacturer or Importer)

Certificate Number: PGNXB04.52NN-015

Effective Date:
08/03/2022

Expiration Date:
12/31/2023


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
08/03/2022

Revision Date:
N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: PGNXB04.52NN
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
Emission Standards :
Part 90 Phase I
NMHC + NOx (g/kW-hr) : 13.4
HC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

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It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

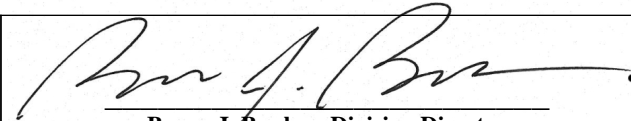


**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT**

**OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105**

Certificate Issued To: Caterpillar Inc.
(U.S. Manufacturer or Importer)
Certificate Number: RCPXL12.5NYS-024

Effective Date:
07/26/2023
Expiration Date:
12/31/2024


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
07/26/2023
Revision Date:
N/A

Model Year: 2024
Manufacturer Type: Original Engine Manufacturer
Engine Family: RCPXL12.5NYS

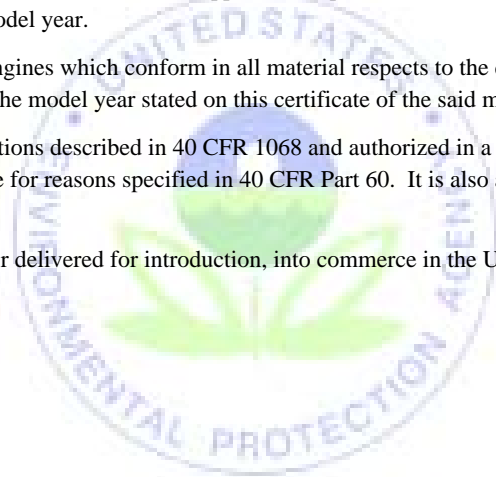
Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.



**KENTUCKY DIVISION OF AIR QUALITY STATEMENT OF BASIS FOR
BLUEOVAL SK, LLC**

**March 2025
Pages 57, 70, 83, and 91**

Emission Unit 06: Natural Gas-Fired Boilers				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
SO ₂	0.8 lbs/MMBtu	401 KAR 59:015, Section 5(1)(b)1.	0.6 lb/MMscf, AP-42 Table 1.4-2	Assumed based upon natural gas combustion
PM	0.10 lbs/MMBtu	401 KAR 59:015, Section 4(1)(b)	0.52 lb/MMscf, 2014 NEI Data	
	20% opacity	401 KAR 59:015, Section 4(2)	--	
CO	50 ppm @ 3% O ₂ on a 3-hr block avg	401 KAR 51:017	37.7 lb/MMscf Burner Specification (APE20210001)	Initial Performance Test for NO _x and CO limitations; Operating Limitations; Monitoring and Recordkeeping Requirements
	1.94 tons/yr each unit			
NO _x	9 ppm @ 3% O ₂ on a 3-hr block avg		11.15 lb/MMscf Burner Specification (APE20240004)	
	0.57 tons/yr each unit			
VOC	0.0054 lb/MMBtu on a 3-hr block avg		5.5 lb/MMscf AP-42 Table 1.4-2	
	0.28 tons/yr each unit			
GHG	117 lb CO ₂ /MMBtu on a 3-hr block avg	CO ₂ : 119,317 lb/MMscf CH ₄ : 2.25 lb/MMscf N ₂ O: 0.22 lb/MMscf CO ₂ e: 119,440 lb/MMscf		
	6154.68 tons CO ₂ e/yr each unit		40 CFR 98 Tables C-1 & C-2	

Initial Construction Date: 5/2022

Process Description:

These indirect heat exchangers are utilized to generate steam for various purposes across the facility

(KY1-B01 - KY1-B11):

Eleven (11) Natural Gas-Fired Boilers

Description:

Maximum Rated Capacity: 12.0 MMBtu/hr, each

Fuel: Natural Gas

Emission Unit 07: Natural Gas-Fired Oil Heaters				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
SO ₂	0.8 lbs/MMBtu	401 KAR 59:015, Section 5(1)(b)1.	0.6 lb/MMscf, AP-42 Table 1.4-2	Assumed based upon natural gas combustion
PM	0.10 lbs/MMBtu	401 KAR 59:015, Section 4(1)(b)	0.52 lb/MMscf, 2014 NEI Data	
	20% opacity	401 KAR 59:015, Section 4(2)	--	
CO	50 ppm @ 3% O ₂ on a 3-hr block avg	401 KAR 51:017	37.7 lb/MMscf Burner Specification (APE20210001)	Initial Performance Test for NO _x and CO limitations; Operating Limitations; Monitoring and Recordkeeping Requirements
	4.50 tons/yr each 27.8 MMBtu/hr unit			
	3.85 tons/yr each 23.8 MMBtu/hr unit			
NO _x	20 ppm @ 3% O ₂ on a 3-hr block avg		24.77 lb/MMscf Burner Specification (APE20210001)	
	2.95 tons/yr each 27.8 MMBtu/hr unit			
	2.53 tons/yr each 23.8 MMBtu/hr unit			
VOC	0.0054 lb/MMBtu on a 3-hr block avg		5.5 lb/MMscf AP-42 Table 1.4-2	
	0.66 tons/yr each 27.8 MMBtu/hr unit			
	0.56 tons/yr each 23.8 MMBtu/hr unit			
GHG	117 lb CO ₂ /MMBtu on a 3-hr block avg		CO ₂ : 119,317 lb/MMscf CH ₄ : 2.25 lb/MMscf N ₂ O: 0.22 lb/MMscf CO ₂ e: 119,440 lb/MMscf	
	14,242.95 tons CO ₂ e/yr each 27.8 MMBtu/hr unit			

Emission Unit 13: Direct-Fired Natural Gas-Fired Dehumidification Units				
Emission Unit 16: Direct-Fired Natural Gas-Fired Coater Oven Air Handling Units				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	2.34 lb/hr	401 KAR 59:010, Section 3(2)	0.52 lb/MMscf 2014 NEI Data	Assumed based upon natural gas combustion
	20% opacity	401 KAR 59:010, Section 3(1)(a)	--	
CO	25 ppm @ 3% O ₂ on a 3-hr block avg EU13	401 KAR 51:017	18.85 lb/MMscf Burner Specification (APE20240004)	Operating Limitations; Monitoring and Recordkeeping Requirements
	50 ppm @ 3% O ₂ on a 3-hr block avg EU16		37.7 lb/MMscf Burner Specification (APE20210001)	
NO _x	89 ppm @ 3% O ₂ on a 3-hr block avg EU13		110.24 lb/MMscf Burner Specification (APE20240004)	
	25 ppm @ 3% O ₂ on a 3-hr block avg EU16		30.97 lb/MMscf Burner Specification (APE20240004)	
VOC	0.0054 lb/MMBtu on a 3-hr block avg		5.5 lb/MMscf AP-42 Table 1.4-2	
CO ₂	117 lb/MMBtu on a 3-hr block avg		119,067 lb/MMscf 40 CFR 98 Table C-1	

Process Description:

These units are utilized for dehumidification and control of the physical and chemical properties of the air space within the cleanroom process environment.

Source #	Source Name	Maximum Rated Capacity (MMBtu/hr)	Construction Commenced
Emission Unit 13 (Direct-Fired)			
KY1-DH01 – KY1-DH46	Natural Gas-Fired Dehumidification Units (Building 1)	2	May 2022
KY2-DH01 –	Natural Gas-Fired Dehumidification Units (Building 2)	2	May 2022

Emission Unit 14: Indirect-Fired Natural Gas-Fired Building Air Handling Units Emission Unit 15: Indirect-Fired Natural Gas-Fired Office Air Handling Units				
Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
PM	0.10 lb/MMBtu	401 KAR 59:015, Section 4(1)(b)	0.52 lb/mmscf 2014 NEI Data	Assumed based upon natural gas combustion
	20% opacity	401 KAR 59:015, Section 4(2)	--	
SO ₂	0.8 lb/MMBtu	401 KAR 59:015, Section 5(1)(b)1.	0.6 lb/MMscf	
CO	50 ppm @ 3% O ₂ on a 3-hr block avg	401 KAR 51:017	37.7 lb/MMscf Burner Specification (APE20210001)	
NO _x	55 ppm @ 3% O ₂ on a 3-hr block avg		68.13 lb/MMscf Burner Specification (APE20210001)	
VOC	0.0054 lb/MMBtu on a 3-hr block avg		5.5 lb/MMscf AP-42 Table 1.4-2	
CO ₂	117 lb/MMBtu on a 3-hr block avg		119,067 lb/MMscf 40 CFR 98 Table C-1	

Process Description:

These units are utilized for dehumidification and control of the physical and chemical properties of the air space within the cleanroom process environment.

Source #	Source Name	Maximum Rated Capacity (MMBtu/hr)	Construction Commenced
Emission Unit 14 (Indirect-Fired)			
KY1-BA01 – KY1-BA10	Natural Gas-Fired Building Air Handling Units (Building 1)	3	May 2022
KY2-BA01 – KY2-BA10	Natural Gas-Fired Building Air Handling Units (Building 2)	3	May 2022
Emission Unit 15 (Indirect-Fired)			
KY1-OA01 – KY1-OA10	Natural Gas-Fired Office Air Handling Units (Building 1)	3	May 2022

**TENNESSEE AIR POLLUTION CONTROL DIVISION, PSD
FINAL DETERMINATION FOR FORD MOTOR COMPANY**

**May 2022
Pages 21 and 22**

Compliance with this limit shall be demonstrated by utilization of ultra-low-NO_x burners, the combustion of pipeline quality natural gas, maintaining and operating combustion sources in accordance with manufacturer recommendations, and compliance with 40 CFR 63, Subpart DDDDD for sources subject to the rule.

V.3.1.5 PM BACT Analysis – All Natural Gas Combustion Units

Particulate emissions from combustion can be categorized as filterable and condensable. Filterable particulates refer to PM, PM₁₀, and PM_{2.5} emissions that are emitted as a solid or liquid which can be captured by a filter. Condensable particulates are emitted as a vapor which condenses upon release from the stack into the ambient air. All condensable particulates are considered to be PM_{2.5}. Due to being a gaseous fuel, the combustion of natural gas inherently produces low concentrations of filterable particulate matter emissions. Condensable particulate is formed from large molecular weight hydrocarbons that are not fully combusted.

Utilizing the RBLC and other available sources of data, Ford identified the following PM reduction options:

- Electrostatic Precipitator (ESP)
- Fabric Filter
- Baghouse
- Multiclone
- Wet (Venturi) Scrubber
- Use of Natural Gas
- Good Combustion Practices

Ford is not aware of any add-on control devices specifically designed to control condensable PM from natural gas combustion sources. However, since condensable VOC emissions from natural gas combustion are large molecular weight hydrocarbons VOC control technologies would also control condensable PM. These control technologies include the following:

- Oxidation Catalyst
- Good Combustion Practices

Please refer to **Section V.3.3.1** for details regarding ESPs, fabric filters, and wet scrubbers and **Section V.3.1.1** for details regarding Oxidation Catalyst technology.

Baghouse: A baghouse system consists of several fabric filters in an enclosure, typically vertically suspended with a tubular shape which is open on one end and closed on the other. Filterable particulate laden exhaust enters from either the inside or outside of the bag, depending on the configuration of the baghouse. As the exhaust passes through the filter media the particulate is captured, forming a filter cake on the side of the bag where exhaust gas enters. The filter cake increases the pressure drop across the baghouse as it builds up and must be periodically removed to keep resistance to air flow from becoming too high for proper functioning of the system. The removal of the filter cake can be accomplished via mechanical shaking of the filters, temporary reversal of air flow through the system, or bursts of compressed air. The frequency of filter cake removal is inversely proportional to the lifespan of the individual filters. Typical baghouse units can achieve removal efficiencies between 99 and 99.9% for systems with gas flow rates up to 1,000,000 scfm and temperatures up to 500°F.

Multiclone: A multiclone system consists of multiple small cyclones operating in parallel. Cyclones operate by creating a wind vortex inside their shell, applying a centrifugal force on the inlet exhaust stream. As the exhaust moves in a circular fashion through the cyclone, the centrifugal force pushes filterable PM in the exhaust stream to the cyclone walls. In general, cyclones are more efficient at removing larger diameter particulate matter. Exhaust streams with a gas flow rate of up to 106,000 scfm at temperatures up to 1,000°F can achieve a removal efficiency of approximately 80-95%.

Add on filterable PM controls: The results from the RBLC database show no natural gas-fired boilers rated below 100 MMBtu/hr that utilize ESP, baghouse, multiclone, or wet scrubber control for filterable PM for BACT compliance. Ford is also not aware of any such system being used in a full-scale industrial setting. The low level of particulate emissions from natural gas combustion makes a significant degree of emission reduction difficult to achieve. Therefore, add on controls for filterable PM are considered technically infeasible.

Oxidation Catalyst: The results from the RBLC database search show no natural gas-fired boilers rated below 100 MMBtu/hr that utilize oxidation catalysts for PM BACT compliance. Ford isn't aware of such a system being utilized in a full-scale industrial setting for boilers or oil heaters. Oxidation catalyst technology for condensable PM control is considered technically infeasible.

Use of Natural Gas: Natural gas is a fuel option inherently low in filterable particulate emissions. The use of natural gas is part of the base design of this facility and is technically feasible.

Good Combustion Practices: The use of good combustion practices, such as maintaining an appropriate oxygen concentration and combustion temperature, facilitates complete combustion and minimizes condensable PM emissions. Good combustion practices are considered technically feasible.

V.3.1.5.1 PM BACT Determination – All Natural Gas Combustion Units

Ford proposes the use of pipeline quality natural gas as fuel and good combustion practices for PM BACT for all natural gas combustion units. Ford proposes a total PM and PM₁₀ limit of 0.52 lb/MMscf on a three-hour block average basis and a PM_{2.5} limit of 0.43 lb/MMscf on a three-hour block average basis. These limits were chosen because they are consistent with EPA's emission factors based on the 2014 National Emissions Inventory data.

Pursuant to TAPCR 1200-03-09-.01(4)(j)3, the following limits are established as BACT for PM:

- An emission rate of 0.52 lb/MMscf of natural gas combusted for Total PM and PM₁₀ on a three-hour block average basis
- An emission rate of 0.43 lb/MMscf of natural gas combusted for PM_{2.5} on a three-hour block average basis

Compliance with these limits shall be assured by the combustion of pipeline quality natural gas and good combustion practices.

V.3.1.6 Greenhouse Gas (GHG) BACT Analysis – All Natural Gas Combustion Units

Carbon dioxide (CO₂) is a product of fuel combustion and a greenhouse gas (GHG). Fuels like natural gas contain carbon that reacts with O₂ during combustion producing CO₂. Approximately 99% of all fuel carbon is converted to CO₂. GHG emissions regulated under PSD are expressed as CO₂ equivalent (CO₂e). CO₂e emissions are the sum of the individual GHG mass emissions adjusted for their global warming potentials (see 40 CFR Part 98, Subpart A, Table A-1). For natural gas combustion sources, the individual GHGs are CO₂, nitrous oxide (N₂O), and methane (CH₄). N₂O is formed as the result of nitrogen reacting with O₂ during combustion, and CH₄ results from incomplete combustion of natural gas. CO₂ comprises approximately 95% of the total CO₂e emissions from combustion.

Utilizing the RBLC and other available sources of data, Ford identified the following CO₂e reduction options:

- Use of natural gas
- Good combustion practices
- Carbon capture

Use of natural gas: Pipeline quality natural gas will be used for this project.

Good combustion practices: Natural gas-fired burner maintenance and operation will be performed according to

**SOUTH CAROLINA BUREAU OF AIR QUALITY, FINAL
DETERMINATION FOR SCOUT MOTORS**

**October 2023
Page 10**

5.0 Final Determination

On September 7, 2023, the BAQ made a preliminary determination that Scout Motors Inc A Delaware Corporation - Blythewood Plant (Scout Motors) may construct an automobile stamping and assembly facility if the emission limitations and conditions as outlined in the draft PSD Construction Permit PSD-50000007 v1.0 are met. This draft construction permit was included as part of the Preliminary Determination. The Statement of Basis that contains explanations of the permitting actions was also included as a part of the Preliminary Determination. The public comment period closed on October 18, 2023. No comments were received from the United States Environmental Protection Agency (EPA), the Federal Land Manager(s), or Scout Motors.

The comments were received from the public but were found to have no technical merit. No changes to the draft documents or determinations were made. For a summary of the comments and the Department's responses, see accompanying document *Response to Comments on Air Quality*.

BAQ has made a final determination that the Scout Motors Inc A Delaware Corporation - Blythewood Plant proposed project may be approved provided that the emission limitations and condition as outlined in Construction Permit No. PSD-50000007 v1.0 are met. A copy of the final issued construction permit is included as part of this Final Determination.

The final BACT determinations are summarized in Table 2.

Table 2 - Summary of BACT			
Process	Pollutant	BACT Control Method	BACT Limit
Rooftop Units	PM/PM ₁₀ /PM _{2.5}	Use of natural gas Good Combustion Practices	0.0005 lb/MMBtu PM/PM ₁₀ 0.0004 lb/MMBtu PM _{2.5}
Topcoat/Tutone	PM/PM ₁₀ /PM _{2.5}	99.5% efficient dry filter	1.0 mg/m ³
Spot and Assembly Repair	PM/PM ₁₀ /PM _{2.5}	98.5% efficient dry filter Good Work Practices	0.075 lb/hr
Emergency Engines	PM/PM ₁₀ /PM _{2.5}	Compliance with NSPS IIII	Limits consistent with 40 CFR 63 Subpart ZZZZ
Body Shop	PM/PM ₁₀ /PM _{2.5}	98.5% efficient dry filter	0.04 lb/hr
Cooling Towers	PM/PM ₁₀ /PM _{2.5}	Drift eliminator	0.001% drift rate
Work Decks	PM/PM ₁₀ /PM _{2.5}	Good Work Practices	--
Roads	PM/PM ₁₀ /PM _{2.5}	Paved and maintaining roads	--
Rooftop Units	VOC	Good Combustion Practices	0.0054 lb/MMBtu
E-Coat	VOC	Oven - RTO Use of low VOC materials	0.23 lbs/GACS
Sealer, Adhesive and Underbody PVC	VOC	Use of low VOC materials	0.25 lbs VOC/gal
Topcoat/Tutone	VOC	Booth - RTO with	3.53 lbs/GACS

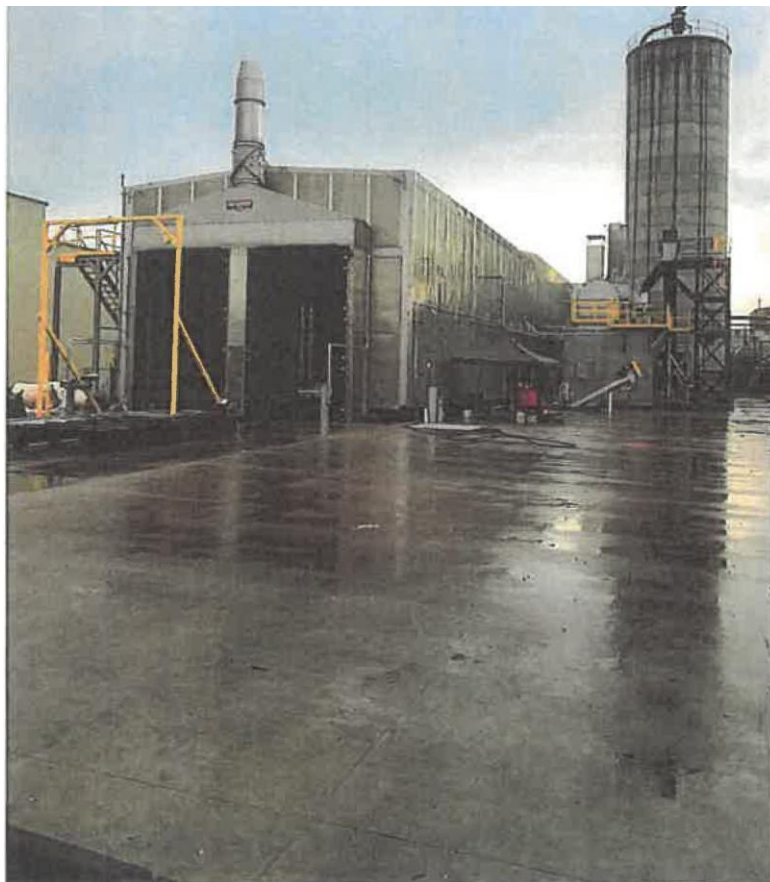
Table 2 - Summary of BACT			
Process	Pollutant	BACT Control Method	BACT Limit
		concentrator Oven - RTO	
Paint Shop / Assembly Spot Repair	VOC	Use of low VOC materials	4.8 lbs VOC/gal
Cavity Wax	VOC	Use of low VOC materials Good Work Practices	1.0 lbs VOC/gal
Purge Solvent	VOC	Use of low VOC materials Good Work Practices Control device where possible	385.82 tpy
Cleaning Solvent	VOC	Use of low VOC materials Good Work Practices	58.8 tpy
Vehicle Polish	VOC	Use of low VOC materials Good Work Practices	3.37 tpy
Body Shop Adhesives	VOC	RTO	0.0005 lb VOC/lb coating
Window and Windshield Glazing / Mounting	VOC	Use of low VOC materials Good Work Practices	0.4 lb VOC/gal
Emergency Engines	VOC	Compliance with 40 CFR 60 Subpart IIII	Limits consistent with 40 CFR 63 Subpart ZZZZ
Storage Tanks	VOC	Good Work Practices	--
Paint Mix Room	VOC	Good Work Practices	--
Fluid Fill	VOC	Good Work Practices	--
Rooftop Units	NOx	Use of low-NOx burners Good Combustion Practices	0.043 lb NOx/MMBtu
Emergency Engines	NOx	Compliance with NSPS IIII	Limits consistent with 40 CFR 63 Subpart ZZZZ
Rooftop Units	CO ₂ e	Use of natural gas Good Combustion Practices	118 lb CO ₂ e/MMBtu
Emergency Engines	CO ₂ e	Compliance with NSPS IIII	164 lb CO ₂ e/MMBtu
Body Shop	CO ₂ e	Good Work Practices	--

APPENDIX I. OPERATION AND MAINTENANCE PLANS FOR KILNS



Canfor Southern Pine

Operating and Maintenance Plan for CDK#1
New South Lumber Company, LLC- Axis Facility
Axis, Mobile County, Alabama



101 Dauphin Street, Mobile, Alabama 36602



Canfor Southern Pine

Contents

1. Introduction
2. Proper Operating Practices
3. Proper Maintenance Practices
 - a. Maintenance to be conducted
 1. Daily Routine Maintenance
 - ii. Weekly Routine Maintenance
 111. Quarterly Routine Maintenance
 - iv. Semiannual Routine Maintenance
 - v. Annual Routine Maintenance
4. Sample Inspection Sheet



Canfor Southern Pine

1. Introduction

The Alabama Department of Environmental Management (ADEM) issued permit number 503-S002-X001-X005 on May 30, 2024, authorizing construction of a Continuous Direct- Fired Kiln (CDK) with a wood-fired 40 MMBtu/hr burner. This permit was issued under the Prevention of Significant Deterioration (PSD) regulations and required Best Available Control Technology (BACT) review for Volatile Organic Compounds (VOC) and Carbon Dioxide Equivalent (CO₂e). BACT was determined to be proper maintenance and operating procedures.

The CDK emission rate achievable under good operating and maintenance practices was determined to be 4.75 lb/MBF for VOC which was expressed as WPPI under the "Wood Products Protocol" and 36,827 tpy for CO₂e. Compliance with this emission rate is presumed as long as the facility continues to carry out the appropriate operating and maintenance procedures.

2. Proper Operating Practices

- a. Operate kilns within an average temperature range recommended by the manufacturer depending on the dimensions of lumber being dried. The temperature shall



Canfor Southern Pine

- be continuously monitored by a dry bulb temperature sensor.
- b. Utilize proper kiln feed rates, which would be recommended by the manufacturer depending upon the dimensions and moisture content of lumber being dried and other variables such as air flow, weather, time of year, and target moisture content.
 - c. Lumber moisture content shall be within all recommended range targets for lumber with a final moisture content.

3. Proper Maintenance Practices

- a. Conduct daily routine maintenance to include all RTDs are working and placed in proper location, check lumber entrance/ exit baffles for placement and damage and report problems, check kiln controls to confirm alarms are functioning properly, check motors, bolts and couplings on the system, check amp meters and indicator lights on pre-wired fan system, check air compressor for proper operation and pressure and leaks, maintain proper operation of the control room's air conditional/ heater to provide appropriate temperature for electrical components;



Canfor Southern Pine

- b. Conduct weekly routine maintenance to include draining water from transducers and air supplies, grease fan shaft bearings outside kiln, grease kiln car wheels if needed, inspect kiln building and pusher system for damage and repair, and check for any hydraulic oil leaks;
- c. Conduct quarterly routine maintenance to include clean tracks through kiln and inspect fans, bearing, and shafts, check internal baffles for damage and report problems in writing to maintenance department, inspect kiln walls and structure for deterioration, check for leaks at fittings, check pusher system for proper operation, hydraulic leaks, and electrical connections;
- d. Conduct semiannual routine maintenance to include check for loose connections on electrical wires and RTDs, inspect kiln building and foundation for damage and repair, check air compressor and all air operated parts;
- e. Conduct annual routine maintenance to include check calibration of all transducers, valves, and vent controls, check fan bearing taper lock for looseness or excessive wear and repair as needed.



Canfor Southern Pine

The facility is required to develop a site-specific plan for operation and maintenance by the following permit condition:

"Within 180 days of issuance of Temporary Authorization to Operate this continuous direct-fired kiln (CDK, the permittee shall develop, implement, and submit to the Air Division a site specific operating and maintenance plan for the CDK. The plan shall identify key parameters to be monitored which are related to VOC emissions from the kiln and the frequency and/ or averaging period of the monitoring. Upon Air Division concurrence with the plan, the Permittee shall begin implementation of the proposed monitoring and recordkeeping."

The large portion of the VOC's emitted by lumber kilns are a result of compounds being released from the wood during the drying process. VOC emissions from drying lumber depends on quite a few factors. Some of those factors include the species of wood, the size, season, operating conditions, and the initial and final moisture content of the lumber.

Proper operation of the kiln is necessary to maintaining the quality product as well as profitability. Proper operation is also a way to minimize VOC emissions. Over drying is known to contribute highly to VOC excess emissions, and can also impact off-spec and reduced lumber quality. To minimize emissions and maximize quality and profitability, the facility invests in high quality



Canfor Southern Pine

software with associated sensors and instrumentation that is operated in accordance with manufacturers specifications. Set point information is important when managing push time, push distance, kiln wet bulb temperature, and desired moisture content.

Specific Operating Parameters

1. Kiln Temperature

- a. 240°-245°F

2. Lumber Moisture Content

- a. The 12-month rolling average moisture content of dried lumber shall be greater than or equal to 13%.

3. Lumber Push Rate

- a. 5 feet/hr

4. Abort Stack Usage

- a. Record and maintain a log of all abort stack usage for the Kiln. The log will include the date, time, length of operation, and reason for abort stack usage.
- b. New South will optimize operation of the kiln to limit the use of abort stacks.



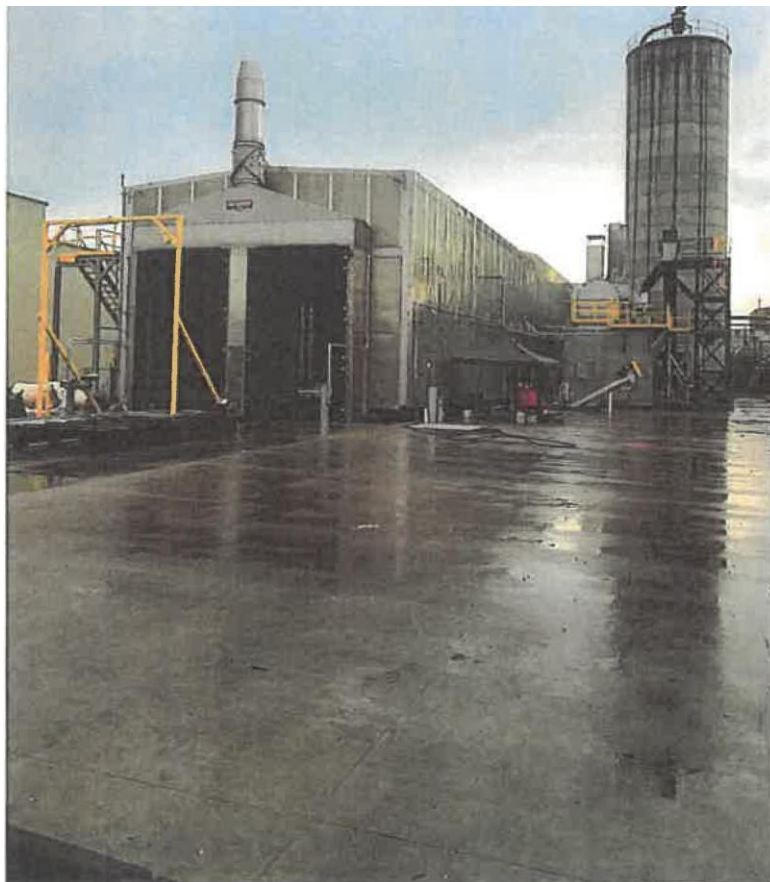
Canfor Southern Pine

Routine Maintenance Checklist



Canfor Southern Pine

Operating and Maintenance Plan for CDK#2
New South Lumber Company, LLC- Axis Facility
Axis, Mobile County, Alabama



101 Dauphin Street, Mobile, Alabama 36602



Canfor Southern Pine

Contents

1. Introduction
2. Proper Operating Practices
3. Proper Maintenance Practices
 - a. Maintenance to be conducted
 1. Daily Routine Maintenance
 - ii. Weekly Routine Maintenance
 111. Quarterly Routine Maintenance
 - iv. Semiannual Routine Maintenance
 - v. Annual Routine Maintenance
4. Sample Inspection Sheet



Canfor Southern Pine

1. Introduction

The Alabama Department of Environmental Management (ADEM) issued permit number 503-S002-X001-X005 on May 30, 2024, authorizing construction of a Continuous Direct- Fired Kiln (CDK) with a wood-fired 40 MMBtu/hr burner. This permit was issued under the Prevention of Significant Deterioration (PSD) regulations and required Best Available Control Technology (BACT) review for Volatile Organic Compounds (VOC) and Carbon Dioxide Equivalent (CO₂e). BACT was determined to be proper maintenance and operating procedures.

The CDK emission rate achievable under good operating and maintenance practices was determined to be 4.75 lb/MBF for VOC which was expressed as WPP1 under the "Wood Products Protocol" and 36,714 tpy for CO₂e. Compliance with this emission rate is presumed as long as the facility continues to carry out the appropriate operating and maintenance procedures.

2. Proper Operating Practices

- a. Operate kilns within an average temperature range recommended by the manufacturer depending on the dimensions of lumber being dried. The temperature shall



Canfor Southern Pine

- be continuously monitored by a dry bulb temperature sensor.
- b. Utilize proper kiln feed rates, which would be recommended by the manufacturer depending upon the dimensions and moisture content of lumber being dried and other variables such as air flow, weather, time of year, and target moisture content.
 - c. Lumber moisture content shall be within all recommended range targets for lumber with a final moisture content.

3. Proper Maintenance Practices

- a. Conduct daily routine maintenance to include all RTDs are working and placed in proper location, check lumber entrance/ exit baffles for placement and damage and report problems, check kiln controls to confirm alarms are functioning properly, check motors, bolts and couplings on the system, check amp meters and indicator lights on pre-wired fan system, check air compressor for proper operation and pressure and leaks, maintain proper operation of the control room's air conditional/ heater to provide appropriate temperature for electrical components;



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- b. Conduct weekly routine maintenance to include draining water from transducers and air supplies, grease fan shaft bearings outside kiln, grease kiln car wheels if needed, inspect kiln building and pusher system for damage and repair, and check for any hydraulic oil leaks;
- c. Conduct quarterly routine maintenance to include clean tracks through kiln and inspect fans, bearing, and shafts, check internal baffles for damage and report problems in writing to maintenance department, inspect kiln walls and structure for deterioration, check for leaks at fittings, check pusher system for proper operation, hydraulic leaks, and electrical connections;
- d. Conduct semiannual routine maintenance to include check for loose connections on electrical wires and RTDs, inspect kiln building and foundation for damage and repair, check air compressor and all air operated parts;
- e. Conduct annual routine maintenance to include check calibration of all transducers, valves, and vent controls, check fan bearing taper lock for looseness or excessive wear and repair as needed.



Canfor Southern Pine

The facility is required to develop a site-specific plan for operation and maintenance by the following permit condition:

"Within 180 days of issuance of Temporary Authorization to Operate this continuous direct-fired kiln (CDK, the permittee shall develop, implement, and submit to the Air Division a site specific operating and maintenance plan for the CDK. The plan shall identify key parameters to be monitored which are related to VOC emissions from the kiln and the frequency and/ or averaging period of the monitoring. Upon Air Division concurrence with the plan, the Permittee shall begin implementation of the proposed monitoring and recordkeeping."

The large portion of the VOC's emitted by lumber kilns are a result of compounds being released from the wood during the drying process. VOC emissions from drying lumber depends on quite a few factors. Some of those factors include the species of wood, the size, season, operating conditions, and the initial and final moisture content of the lumber.

Proper operation of the kiln is necessary to maintaining the quality product as well as profitability. Proper operation is also a way to minimize VOC emissions. Over drying is known to contribute highly to VOC excess emissions, and can also impact off-spec and reduced lumber quality. To minimize emissions and maximize quality and profitability, the facility invests in high quality



Canfor Southern Pine

software with associated sensors and instrumentation that is operated in accordance with manufacturers specifications. Set point information is important when managing push time, push distance, kiln wet bulb temperature, and desired moisture content.

Specific Operating Parameters

1. Kiln Temperature

- a. 240°-245°F

2. Lumber Moisture Content

- a. The 12-month rolling average moisture content of dried lumber shall be greater than or equal to 13%.

3. Lumber Push Rate

- a. 5 feet/hr

4. Abort Stack Usage

- a. Record and maintain a log of all abort stack usage for the Kiln. The log will include the date, time, length of operation, and reason for abort stack usage.
- b. New South will optimize operation of the kiln to limit the use of abort stacks.



Canfor Southern Pine

Routine Maintenance Checklist

Canfor Axis, Alabama
CDK No. 2 Routine Maintenance Checklist (X002-CDK-2)

Date:								
Daily Procedures	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	COMMENTS
Check lumber entrance/ exit baffles for placement and damage								
Ensure RTDs are working and in place.								
Rail space on the out feed end is available on each track								
Check air compressor for proper operation, pressure and leaks								
Check controls to confirm alarms are operating properly								
Check amp meters and indicator lighting on fans								
Inspect fuel feed and lubricate bearing and bolts as required								
Check motors, bolts and couplings on the system								
Check MCC and control room for cleanliness and proper temperature								
Visually check opacity from Cyclone. If VE are present, initiate corrective action immediately								
Weekly Procedures								
Inspect Kiln building and pusher system for damage and repair								
Drain water from transducers and air supplies								
Grease fan shaft bearings outside kiln								
Check for hydraulic oil leaks								
Grease kiln car wheels								



Canfor Southern Pine

Operating and Maintenance Plan for CDK#3
New South Lumber Company, LLC- Axis Facility
Axis, Mobile County, Alabama



101 Dauphin Street, Mobile, Alabama 36602



Canfor Southern Pine

Contents

1. Introduction
2. Proper Operating Practices
3. Proper Maintenance Practices
 - a. Maintenance to be conducted
 1. Daily Routine Maintenance
 - ii. Weekly Routine Maintenance
 111. Quarterly Routine Maintenance
 - iv. Semiannual Routine Maintenance
 - v. Annual Routine Maintenance
4. Sample Inspection Sheet



Canfor Southern Pine

1. Introduction

The Alabama Department of Environmental Management (ADEM) issued permit number 503-S002-X001-X005 on May 30, 2024, authorizing construction of a Continuous Direct-Fired Kiln (CDK) with a natural gas-fired 45 MMBtu/hr burner. This permit was issued under the Prevention of Significant Deterioration (PSD) regulations and required Best Available Control Technology (BACT) review for Volatile Organic Compounds (VOC) and Carbon Dioxide Equivalent (CO₂e). BACT was determined to be proper maintenance and operating procedures.

The CDK emission rate achievable under good operating and maintenance practices was determined to be 4.75 lb/MBF for VOC which was expressed as WPPI under the "Wood Products Protocol" and 23,080 tpy for CO₂e. Compliance with this emission rate is presumed as long as the facility continues to carry out the appropriate operating and maintenance procedures.

2. Proper Operating Practices

- a. Operate kilns within an average temperature range recommended by the manufacturer depending on the dimensions of lumber being dried. The temperature shall



Canfor Southern Pine

- be continuously monitored by a dry bulb temperature sensor.
- b. Utilize proper kiln feed rates, which would be recommended by the manufacturer depending upon the dimensions and moisture content of lumber being dried and other variables such as air flow, weather, time of year, and target moisture content.
 - c. Lumber moisture content shall be within all recommended range targets for lumber with a final moisture content.

3. Proper Maintenance Practices

- a. Conduct daily routine maintenance to include all RTDs are working and placed in proper location, check lumber entrance/ exit baffles for placement and damage and report problems, check kiln controls to confirm alarms are functioning properly, check motors, bolts and couplings on the system, check amp meters and indicator lights on pre-wired fan system, check air compressor for proper operation and pressure and leaks, maintain proper operation of the control room's air conditional/ heater to provide appropriate temperature for electrical components;



Canfor Southern Pine

- b. Conduct weekly routine maintenance to include draining water from transducers and air supplies, grease fan shaft bearings outside kiln, grease kiln car wheels if needed, inspect kiln building and pusher system for damage and repair, and check for any hydraulic oil leaks;
- c. Conduct quarterly routine maintenance to include clean tracks through kiln and inspect fans, bearing, and shafts, check internal baffles for damage and report problems in writing to maintenance department, inspect kiln walls and structure for deterioration, check for leaks at fittings, check pusher system for proper operation, hydraulic leaks, and electrical connections;
- d. Conduct semiannual routine maintenance to include check for loose connections on electrical wires and RTDs, inspect kiln building and foundation for damage and repair, check air compressor and all air operated parts;
- e. Conduct annual routine maintenance to include check calibration of all transducers, valves, and vent controls, check fan bearing taper lock for looseness or excessive wear, and repair as needed.



Canfor Southern Pine

The facility is required to develop a site-specific plan for operation and maintenance by the following permit condition:

"Within 180 days of issuance of Temporary Authorization to Operate this continuous direct-fired kiln (CDK, the permittee shall develop, implement, and submit to the Air Division a site specific operating and maintenance plan for the CDK. The plan shall identify key parameters to be monitored which are related to VOC emissions from the kiln and the frequency and/ or averaging period of the monitoring. Upon Air Division concurrence with the plan, the Permittee shall begin implementation of the proposed monitoring and recordkeeping."

The large portion of the VOC's emitted by lumber kilns are a result of compounds being released from the wood during the drying process. VOC emissions from drying lumber depends on quite a few factors. Some of those factors include the species of wood, the size, season, operating conditions, and the initial and final moisture content of the lumber.

Proper operation of the kiln is necessary to maintaining the quality product as well as profitability. Proper operation is also a way to minimize VOC emissions. Over drying is known to contribute highly to VOC excess emissions, and can also impact off-spec and reduced lumber quality. To minimize emissions and maximize quality and profitability, the facility invests in high quality



Canfor Southern Pine

software with associated sensors and instrumentation that is operated in accordance with manufacturers specifications. Set point information is important when managing push time, push distance, kiln wet bulb temperature, and desired moisture content.

Specific Operating Parameters

1. Kiln Temperature

- a. 240°-245°F

2. Lumber Moisture Content

- a. The 12-month rolling average moisture content of dried lumber shall be greater than or equal to 13%.

3. Lumber Push Rate

- a. 5 feet/hr



Canfor Southern Pine

Routine Maintenance Checklist

Canfor Axis, Alabama
CDK No. 3 Routine Maintenance Checklist (X002-CDK-3)

Date:								
Daily Procedures	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	COMMENTS
Check lumber entrance/ exit baffles for placement and damage								
Ensure RTDs are working and in place.								
Rail space on the out feed end is available on each track								
Check air compressor for proper operation, pressure and leaks								
Check controls to confirm alarms are operating properly								
Check amp meters and indicator lighting on fans								
Inspect fuel feed and lubricate bearing and bolts as required								
Check motors, bolts and couplings on the system								
Check MCC and control room for cleanliness and proper temperature								
Weekly Procedures								
Inspect Kiln building and pusher system for damage and repair								
Drain water from transducers and air supplies								
Grease fan shaft bearings outside kiln								
Check for hydraulic oil leaks								
Grease kiln car wheels								



Canfor Southern Pine

Operating and Maintenance Plan for CDK#4
New South Lumber Company, LLC- Axis Facility
Axis, Mobile County, Alabama



101 Dauphin Street, Mobile, Alabama 36602



Canfor Southern Pine

Contents

1. Introduction
2. Proper Operating Practices
3. Proper Maintenance Practices
 - a. Maintenance to be conducted
 1. Daily Routine Maintenance
 - ii. Weekly Routine Maintenance
 111. Quarterly Routine Maintenance
 - iv. Semiannual Routine Maintenance
 - v. Annual Routine Maintenance
4. Sample Inspection Sheet



Canfor Southern Pine

1. Introduction

The Alabama Department of Environmental Management (ADEM) issued permit number 503-S002-X001-X005 on May 30, 2024, authorizing construction of a Continuous Direct-Fired Kiln (CDK) with a natural gas-fired 45 MMBtu/hr burner. This permit was issued under the Prevention of Significant Deterioration (PSD) regulations and required Best Available Control Technology (BACT) review for Volatile Organic Compounds (VOC) and Carbon Dioxide Equivalent (CO₂e). BACT was determined to be proper maintenance and operating procedures.

The CDK emission rate achievable under good operating and maintenance practices was determined to be 4.75 lb/MBF for VOC which was expressed as WPPI under the "Wood Products Protocol" and 23,080 tpy for CO₂e. Compliance with this emission rate is presumed as long as the facility continues to carry out the appropriate operating and maintenance procedures.

2. Proper Operating Practices

- a. Operate kilns within an average temperature range recommended by the manufacturer depending on the dimensions of lumber being dried. The temperature shall



Canfor Southern Pine

- be continuously monitored by a dry bulb temperature sensor.
- b. Utilize proper kiln feed rates, which would be recommended by the manufacturer depending upon the dimensions and moisture content of lumber being dried and other variables such as air flow, weather, time of year, and target moisture content.
 - c. Lumber moisture content shall be within all recommended range targets for lumber with a final moisture content.

3. Proper Maintenance Practices

- a. Conduct daily routine maintenance to include all RTDs are working and placed in proper location, check lumber entrance/ exit baffles for placement and damage and report problems, check kiln controls to confirm alarms are functioning properly, check motors, bolts and couplings on the system, check amp meters and indicator lights on pre-wired fan system, check air compressor for proper operation and pressure and leaks, maintain proper operation of the control room's air conditional/ heater to provide appropriate temperature for electrical components;



Canfor Southern Pine

- b. Conduct weekly routine maintenance to include draining water from transducers and air supplies, grease fan shaft bearings outside kiln, grease kiln car wheels if needed, inspect kiln building and pusher system for damage and repair, and check for any hydraulic oil leaks;
- c. Conduct quarterly routine maintenance to include clean tracks through kiln and inspect fans, bearing, and shafts, check internal baffles for damage and report problems in writing to maintenance department, inspect kiln walls and structure for deterioration, check for leaks at fittings, check pusher system for proper operation, hydraulic leaks, and electrical connections;
- d. Conduct semiannual routine maintenance to include check for loose connections on electrical wires and RTDs, inspect kiln building and foundation for damage and repair, check air compressor and all air operated parts;
- e. Conduct annual routine maintenance to include check calibration of all transducers, valves, and vent controls, check fan bearing taper lock for looseness or excessive wear, and repair as needed.



Canfor Southern Pine

The facility is required to develop a site-specific plan for operation and maintenance by the following permit condition:

"Within 180 days of issuance of Temporary Authorization to Operate this continuous direct-fired kiln (CDK, the permittee shall develop, implement, and submit to the Air Division a site specific operating and maintenance plan for the CDK. The plan shall identify key parameters to be monitored which are related to VOC emissions from the kiln and the frequency and/or averaging period of the monitoring. Upon Air Division concurrence with the plan, the Permittee shall begin implementation of the proposed monitoring and recordkeeping."

The large portion of the VOC's emitted by lumber kilns are a result of compounds being released from the wood during the drying process. VOC emissions from drying lumber depends on quite a few factors. Some of those factors include the species of wood, the size, season, operating conditions, and the initial and final moisture content of the lumber.

Proper operation of the kiln is necessary to maintaining the quality product as well as profitability. Proper operation is also a way to minimize VOC emissions. Over drying is known to contribute highly to VOC excess emissions, and can also impact off-spec and reduced lumber quality. To minimize emissions and maximize quality and profitability, the facility invests in high quality



Canfor Southern Pine

software with associated sensors and instrumentation that is operated in accordance with manufacturers specifications. Set point information is important when managing push time, push distance, kiln wet bulb temperature, and desired moisture content.

Specific Operating Parameters

1. Kiln Temperature

- a. 240°-245°F

2. Lumber Moisture Content

- a. The 12-month rolling average moisture content of dried lumber shall be greater than or equal to 13%.

3. Lumber Push Rate

- a. 5 feet/hr



Canfor Southern Pine

Routine Maintenance Checklist

