Application to Modify the No. 1 and No. 3 Paper Machines

Prepared for

Boise White Paper, LLC
Jackson, Alabama

December 2020

Prepared by

Spivey Engineering Solutions, LLC

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SECTION 1

Introduction

Boise White Paper, LLC (Boise), a wholly-owned subsidiary of Packaging Corporation of America (PCA), operates an integrated bleached Kraft pulp and paper mill in Jackson, Alabama. The Jackson Mill produces bleached pulp and 1,350 tons per day of uncoated freesheet paper and has recently incurred more than five months of market-related downtime due to the COVID-19 pandemic. The Mill's primary product is copy/printer paper that is typically used by schools, businesses, and government agencies. The anticipated future market demand for copy/printer paper may not recover to pre-pandemic levels because of the increased implementation of teleworking and video-based education.

Boise proposes to implement equipment modifications that will convert the existing No. 1 and No. 3 Paper Machines to the manufacture of unbleached Kraft containerboard using virgin unbleached Kraft pulp, recycled pulp, or a mixture of virgin and recycled unbleached pulp. The facility also proposes to construct a new 1,250 air-dry ton per day (ADTPD) Recycled Fiber Plant, to modify the existing Deink Plant to process old corrugated container (OCC) and double-lined Kraft (DLK) recycled pulp, and to convert the existing pre-bleach decker and D_{100} and D-1 stage bleach washers into a second brown stock washer line.

This report was prepared to accompany applications to the Alabama Department of Environmental Management (ADEM) for permits to construct and operate modified sources of air pollutant emissions. It describes the proposed modifications and addresses all requirements for Prevention of Significant Deterioration (PSD) as set forth in the *Code of Federal Regulations* promulgated by the United States Environmental Protection Agency (EPA) and the ADEM Administrative Code.

This permit application was prepared by Spivey Engineering Solutions, with modeled emissions of precursors evaluation assistance provided by All4, Inc. Completed application forms are provided in Appendix A to this document. Questions regarding the participation of Spivey Engineering Solutions and All4, Inc. in this effort can be addressed to the individuals listed below at Spivey Engineering in Montgomery, Alabama, or All4, Inc.:

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SECTION 2

Facility Description

2.1 General

Facility Name:	Boise White Paper, LLC
Owner:	Boise White Paper, LLC
Facility ID:	102-0001
Contact:	Thomas Brett Horton Senior Environmental Engineer Boise White Paper, LLC 4585 Industrial Road Jackson, AL 36545 Telephone (251) 246-8242 FAX (251) 246-8361 e-mail: BrettHorton@packagingcorp.com

2.2 Site Description

The Jackson Mill is located at 4585 Industrial Road, off U. S. Highway 43, in Jackson, Alabama. The areas surrounding the site include residential neighborhoods, rural agricultural activities, and light industrial activities. The manufacturing complex is located on 1,100 acres of land approximately 3 kilometers (2 miles) south of the Jackson city center, as shown in Figure 2-1. The site is in Clarke County and is bordered to the north by Industrial Road, to the east by land owned by Scotch & Gulf Lumber, LLC, Depot Road, and Bassett Creek, to the south by Bassett Creek, and to the west by the Tombigbee River. There are no major metropolitan areas within 75 kilometers of the mill. A layout of the Jackson Mill is illustrated in Figure 2-2.

2.3 Project Description

The existing No. 1 and No. 3 Paper Machines will be converted from bleached Kraft paper production to unbleached Kraft paper production. The equipment modifications are described in Section 2.3.2.

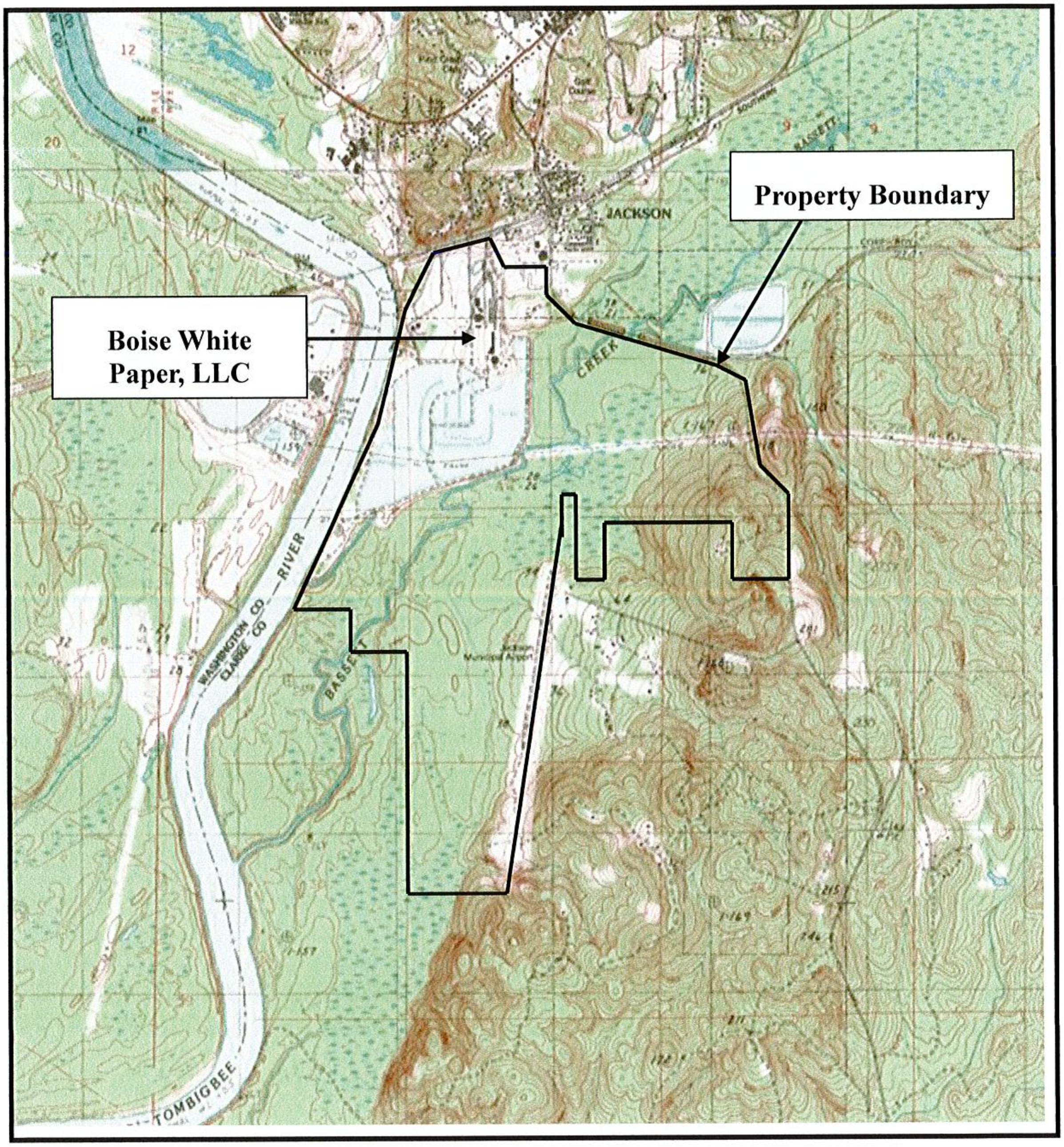
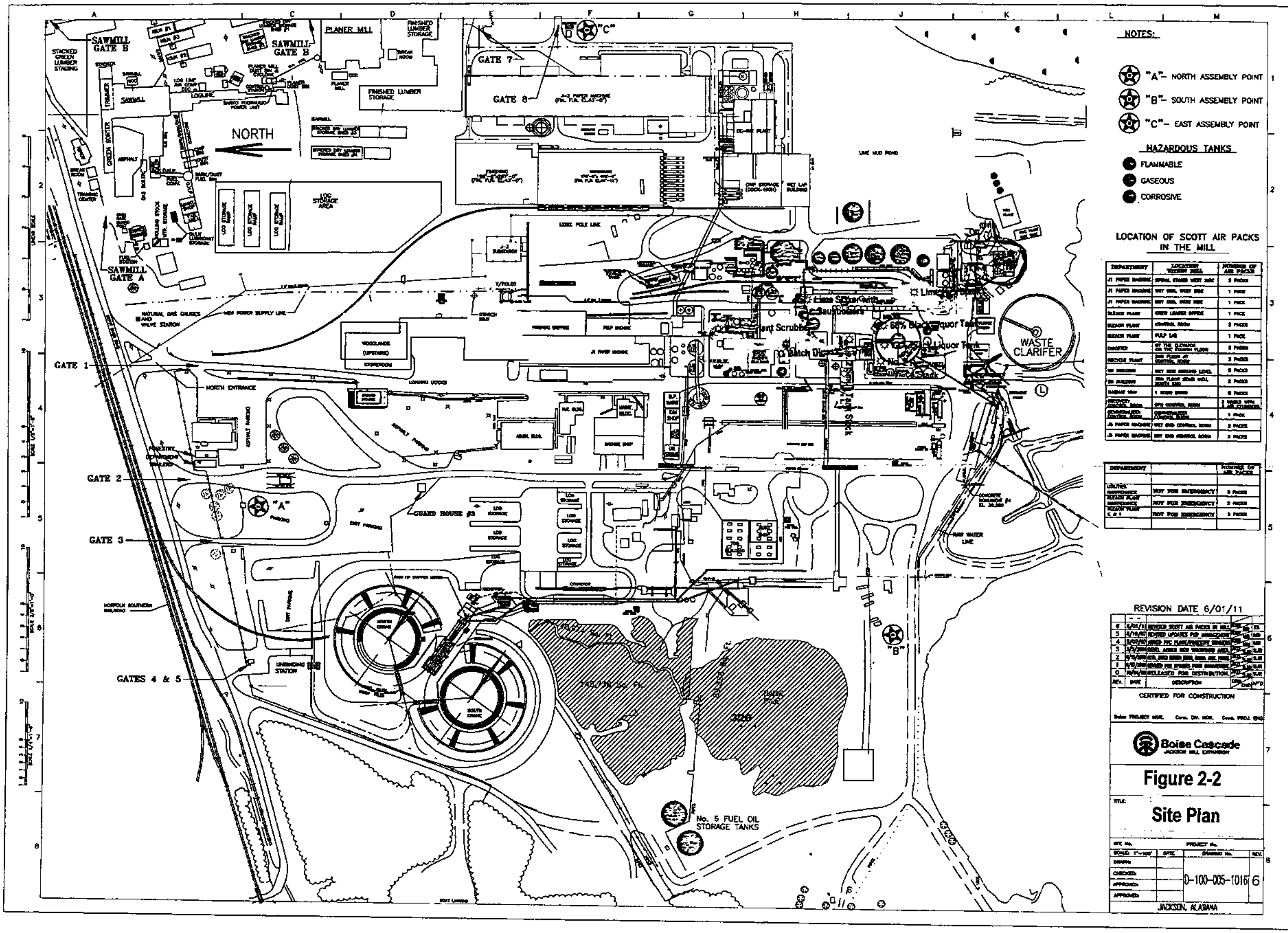


Figure 2-1. Site Map
Boise White Paper, LLC – Jackson, Alabama



NOTES:
"A" – NORTH ASSEMBLY POINT
"B" – SOUTH ASSEMBLY POINT
"C" – EAST ASSEMBLY POINT
HAZARDOUS TANKS
FLAMMABLE
GASEOUS
CORROSIVE
LOCATION OF SCOTT AIR PACKS IN THE MILL
REVISION DATE 6/01/11
CERTIFIED FOR CONSTRUCTION
Boise Cascade
Figure 2-2
Site Plan
0-100-005-1015 6
JACKSON, ALABAMA
NORTH
SAWMILL GATE A
SAWMILL GATE B
PLANER MILL
GATE 1
GATE 2
GATE 3
GATES 4 & 5
GATE 7
GATE 8
NORTH ENTRANCE
GUARD HOUSE #2
WASTE CLARIFER
No. 5 FUEL OIL STORAGE TANKS

2.3.1 No. 1 Paper Machine Conversion

PCA proposes several equipment modifications to convert the No. 1 Paper Machine from a bleached Kraft paper machine to an unbleached Kraft paper machine using virgin unbleached Kraft pulp, recycled pulp, or a combination of virgin and recycled pulp furnish. The target production rate will be 600 machine-dry tons per day. Specific machine modifications necessary to achieve the target production rate will be determined subsequent to the new OCC plant coming on line.

2.3.2 No. 3 Paper Machine Conversion

PCA proposes several equipment modifications to convert the No. 3 Paper Machine from a bleached Kraft paper machine to an unbleached Kraft linerboard machine using virgin unbleached Kraft pulp, recycled pulp, or a combination of virgin and recycled pulp furnish. The design production rate will be 2,500 machine-dry tons per day of Kraft linerboard. The proposed modifications include:

- Removal of the existing size press;
- Upgrade of the machine wet end;
- Upgrade of the machine dry end;
- Upgrade of the winder section; and
- Conversion of the J-3 Bleached High Density Pulp Chest (1,000-ton capacity) to an unbleached Kraft high density pulp storage chest.

The proposed modifications to the two paper machines will result in a net increase in steam consumption of approximately 298,000 pounds per hour. The additional steam will be provided by the existing No. 4 and No. 5 Power Boilers. No modifications to the boilers will be required to generate the additional steam.

2.3.3 New Recycled Fiber Plant

PCA proposes to construct a new 1,250 air-dry ton per day recycled fiber plant. The recycled fiber plant will convert pre- and post-consumer OCC and DLK materials into recycled fiber that will be processed by the No. 1 and No. 3 Paper Machines. A new 1,000-ton high density storage tank will be constructed to store recycled fiber.

2.3.4 Other Mill Emission Units

PCA is proposing additional modifications for other mill emission units as part of this permit application. These modifications include conversion of the existing Deink Plant to a recycled fiber plant for OCC and DLK furnish and retirement of the existing Bleach Plant and the existing Chlorine Dioxide Plant.

2.3.4.1 Deink Plant

PCA proposes to modify the existing Deink Plant to produce recycled pulp fiber from OCC and DLK furnish at a rate of 300 tons of recycled fiber produced per day. The Deink Plant currently processes pre- and post-consumer mixed office paper for recycle to the facility's bleached Kraft paper machines.

2.3.4.2 Kraft Pulp Mill

PCA proposes to convert the existing pre-bleach decker, D_{100} bleach washer, and D-1 bleach washer into the No. 2 Brown Stock Washer System. Additional modifications to the pulping process may be made but new equipment will either be pressurized with no air emissions or air emissions will be captured in the High Volume Low Concentration (HVLC) closed-vent system for destruction. Emissions from the No. 2 Brown Stock Washer System are subject to 40 CFR Part 60 Subpart BB and will be captured by the HVLC system and burned in the Combination Boiler.

2.3.4.3 Bleach Plant

PCA proposes to permanently retire the facility's Bleach Plant towers and to repurpose the D100 and D-1 bleach washers and two filtrate tanks as part of the No. 2 Brown Stock Washer System.

2.3.4.4 Chlorine Dioxide Plant

PCA proposes to permanently retire the facility's Chlorine Dioxide Plant.

2.3.4.5 PCA Drop Lot

PCA proposes to construct a gravel parking lot for staging tractor trailers in close proximity to the mill. The proposed parking area will consist of 100 parking spaces and a truck turn-around. Fugitive emissions will be minimized by operation of a water truck.

2.4 Operating Rates

Table 2-1 summarizes the process capacity ratings for the components associated with the proposed modifications. With the exception of planned maintenance outages, PCA plans to operate the Jackson Mill on a continuous basis, 24 hours per day and seven days per week.

Equipment	Existing Rated Capacity	Proposed Rated Capacity
No. 1 Paper Machine (X026)	475 machine-dry tons per day (bleached uncoated free sheet)	600 machine-dry tons per day (unbleached Kraft paper)
No. 3 Paper Machine (X027)	1,400 machine-dry tons per day (bleached uncoated free sheet)	2,500 machine-dry tons per day (unbleached Kraft linerboard)
Deink Plant (X028)	275 tons per day (mixed office waste paper)	300 tons per day (recycled OCC and DLK fiber)
New Recycled Fiber Plant (X033)	N/A	1,250 tons per day (recycled OCC and DLK fiber)
No. 2 Brown Stock Washer System (X034)	N/A	800 air-dry tons per day (unbleached Kraft pulp)

SECTION 3

Project Emissions Information

3.1 PSD Analysis

The proposed modifications that have been described in Section 2.3 will result in a significant increase in the air emissions for two criteria pollutants from Boise's Jackson (Alabama) Paper Mill with respect to ADEM Administrative Code Rule 335-3-14-.04 (Prevention of Significant Deterioration). The projected increase in emissions of volatile organic compounds (VOC) and greenhouse gases (CO_2e) exceed the respective significant emission rates for ozone and CO_2e. Table 3-1 summarizes the emissions for all pollutants before and after the modifications and provides the net emissions increase (in tons per year) for each pollutant. The emission estimates provided in Table 3-1 are based on detailed spreadsheet-based calculations, copies of which are included for each source of emissions in Appendix B. The increases in emissions shown in the tables are based on the difference between projected actual and baseline actual emissions. The total projected increase in emissions associated with the proposed modifications is summarized below:

Regulated Pollutant	Maximum Expected Emissions Increase (tons/yr)	PSD Threshold for Major Modification (tons/yr)
PM	10.16	25
PM-10	2.80	15
PM-2.5	-2.14	10
SO_2	1.08	40
NO_X	0	40
CO	-185.19	100
CO_2e	216,039	75,000
VOC	404.43	40
TRS	1.41	10
H_2S	0.22	10
Lead	0.0009	0.6

Table 3-1
Comparison of Projected Actual Emissions to Baseline Actual Emissions
Boise White Paper, LLC, Jackson, Alabama

Emissions Unit	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	CO_2e	VOC	TRS	H_2S	Lead
No. 1 Paper Machine	2.74	3.72	2.96	NA	NA	NA	NA	16.41	NA	NA	NA
No. 3 Paper Machine	11.41	15.51	12.32	NA	NA	NA	NA	376.85	NA	NA	NA
Deink Plant	NA	NA	NA	NA	NA	NA	NA	0.44	NA	NA	NA
New Recycled Fiber Plant	NA	NA	NA	NA	NA	NA	NA	1.83	NA	NA	NA
J3 High Density Storage Chest	NA	NA	NA	NA	NA	NA	NA	27.81	2.33	0.049	NA
PCA Drop Lot (Trailer Parking)	5.14	1.31	0.13	NA	NA	NA	NA	NA	NA	NA	NA
New Brown Stock Washer Line	NA	NA	NA	NA	NA	NA	NA	4.35	0.08	0.0036	NA
Affected Emission Units											
No. 4 and No. 5 Power Boilers	0.28	1.68	1.49	1.08	0	0	216,039	18.45	NA	NA	0.0009
Tall Oil Plant	NA	NA	NA	NA	NA	NA	NA	27.07	0.36	0.17	NA
Plant Roads	6.67	1.33	0.33	NA	NA	NA	NA	NA	NA	NA	NA
Projected Actual Emissions (tpy)	26.23	23.56	17.23	1.08	0	0	216,039	473.20	2.77	0.22	0.0009
No. 1 Paper Machine	2.21	3.12	2.95	NA	NA	NA	NA	8.86	NA	NA	NA
No. 3 Paper Machine	7.45	10.50	9.93	NA	NA	NA	NA	29.84	NA	NA	NA
Deink Plant	NA	NA	NA	NA	NA	NA	NA	2.90	NA	NA	NA
E-1 Bleach Tower	NA	NA	NA	NA	NA	5.33	NA	3.73	NA	NA	NA
E-1 Filtrate Tank	NA	NA	NA	NA	NA	NA	NA	3.27	NA	NA	NA
Bleach Plant Scrubber	6.41	7.13	6.49	NA	NA	179.86	NA	19.46	1.36	NA	NA
ClO_2 Plant	NA	NA	NA	NA	NA	NA	NA	0.27	NA	NA	NA
Methanol Tank	NA	NA	NA	NA	NA	NA	NA	0.43	NA	NA	NA
Baseline Actual Emissions[2] (tpy)	16.07	20.76	19.37	0.00	0.00	185.19	0.00	68.77	1.36	0.00	0.0000
Net Emissions Increase (tpy)	10.16	2.80	-2.14	1.08	0.00	-185.19	216,039	404.43	1.41	0.22	0.0009

[1]Emissions of NOx and CO from Power Boilers 4 and 5 are excludable because they were federally permitted as part of PSD permits issued on 9/18/1995 and 5/10/1996, respectively.

[2]Baseline Actual Emissions are based on the average annual production for January 2013-December 2014 for all pollutants.

Baseline actual emissions are based upon mill operating data from the January 2013-December 2014 operating period for all pollutants. Because the project-related emission increases for VOC and CO_2e are greater than the respective PSD significant emission rates for these pollutants, a netting analysis is required for VOC and CO_2e.

3.2 Netting Analysis

Because the project-related emission increases for VOC and CO_2e are greater than the respective PSD significant emission rates for these pollutants, a netting analysis that accounts for contemporaneous emission increases and decreases at the Jackson Mill is required. The purpose of the netting analysis is to evaluate emission increases and creditable decreases associated with projects at the Jackson Mill that occurred over the contemporaneous period such that the net increase or decrease in emissions is included in the PSD applicability analysis for a given regulated NSR pollutant.

To complete the netting analysis, contemporaneous and creditable emission increases and decreases were combined with increases directly attributable to the project to determine the total net emissions change. The contemporaneous period begins five years prior to the date that construction is expected to commence and ends when the emissions increase from the project occurs (i.e., the return to normal operation after the project). The netting analysis was prepared for VOC and CO_2e as noted above.

Table 3-2 summarizes the total project-related increases in emissions after netting and compares them to each pollutant's PSD significant emission rate. As shown in Table 3-2, the proposed project will result in a net increase of emissions that is significant for PSD for VOC and CO_2e.

Table 3-2. Summary of Project-Related Emission Increases (With Netting)

Parameter	Units	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	CO_2e	VOC	TRS	H_2S	Lead
Contemporaneous Increases [1]	tpy	0.04	0.04	0.04	0.00	0.76	0.67	133	0.48	N/A	N/A	N/A
Total Project-Related Increases	tpy	10.16	2.80	-2.14	1.08	0	-185.19	216,039	404.43	1.41	0.22	0.0009
PSD Significant Emission Rates	tpy	25	15	10	40	40	100	75,000	40	10	10	0.6
PSD Significant?		**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**

[1]The Jackson Mill received a construction permit for the Admin Server Building Emergency Generator on 11-30-2016 and submitted an application to construct a green liquor dregs filter on 11-7-2017.

The modifications proposed in this application are considered to be major as defined in ADEM Administrative Code R. 335-3-14-.04 for VOC and CO_2e. As such, a PSD permit application is required, including a demonstration of best available control technology (BACT) and an air quality modeling evaluation to assess the ozone impacts since VOC is a precursor to ozone.

3.3 Air Toxic Emissions

EPA's guidance on the assessment of non-regulated "air toxic" pollutants requires that permit applicants evaluate emissions for those toxic air pollutants which the facility could emit in amounts potentially of concern to the public. The sources that are affected by the modifications that are being proposed in this application are the No. 1 and No. 3 Paper Machines, the Deink Plant, the New Recycled Fiber Plant, the J-3 High Density Pulp Storage Chest, the No. 2 Brown Stock Washer System, the No. 4 and No. 5 Power Boilers, and the Tall Oil Plant. On April 15, 1998, EPA promulgated the NESHAP for the Pulp and Paper Industry (MACT I) as 40 CFR Part 63 Subpart S. This NESHAP regulates air toxic emissions from multiple-effect evaporator systems, batch digester systems, and Kraft pulp washing systems. Paper machines and recycle plants were included in the source category for Subpart S but no regulatory limits were prescribed for these sources by EPA. On January 31, 2013, EPA promulgated the NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters as 40 CFR Part 63 Subpart DDDDD. This NESHAP regulates air toxic emissions from industrial boilers. The Jackson Mill has demonstrated compliance with all NESHAP requirements for control of air toxic emissions from the emission units subject to these standards.

SECTION 4

Applicable Regulations

4.1 Federal Air Quality Requirements

4.1.1 New Source Review

The Jackson Mill is located in Clarke County, Alabama. Clarke County is considered to be an attainment area, or unclassifiable, with respect to the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. Therefore, only the federal PSD permitting requirements apply to the proposed project, and non-attainment new source review (NNSR) has not been considered in this review.

The Jackson Mill is an existing major stationary source with respect to PSD. Project-related emissions from PCA's proposed modifications to the No. 1 and No. 3 Paper Machines and Deink Plant and construction of the new Recycled Fiber Plant are provided in Section 3. The net increase in annual emissions from the facility for VOC and CO_2e will each exceed the applicable significant emission rates that trigger PSD review for these pollutants. Therefore, the facility modifications will constitute a major source of emissions under the regulations governing PSD (40 CFR 52.21). As a result, a modeled emissions of precursors evaluation and demonstration of BACT is required for VOC.

4.1.2 New Source Performance Standards (NSPS)

The EPA has promulgated standards of performance for new, modified, and reconstructed sources of air pollution in 40 CFR Part 60. The following Part 60 subparts potentially apply to the proposed project:

- 40 CFR Part 60 Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR Part 60 Subpart BB – Standards of Performance for Kraft Pulp Mills
- 40 CFR Part 60 Subpart BBa – Standards of Performance for Kraft Pulp Mill Affected Sources for which Construction, Reconstruction, or Modification Commenced After May 23, 2013

4.1.2.1 40 CFR Part 60 Subpart Db

NSPS Subpart Db establishes PM, SO_2, and NOx emission standards and testing, monitoring, reporting, and record-keeping requirements for steam-generating units constructed, modified, or reconstructed after June 19, 1984 and that have a heat input capacity greater than 100 million BTU per hour (MMBTU/hr). The No. 4 (102-0001-X025) and No. 5 (102-0001-X029) Power Boilers are currently subject to the NSPS for Industrial-Commercial-Institutional Steam Generating Units. Both boilers were permitted in the mid-1990's with BACT limits for NOx and CO, and both boilers are equipped with continuous emissions monitoring systems for NOx and CO. A "modification" under NSPS is defined in 40 CFR §60.14. Pursuant to 40 CFR §60.14(e)(2), an increase in the production rate of an existing facility is not considered an NSPS modification if that increase can be achieved without a capital expenditure on the facility. The No. 4 and No. 5 Power Boilers will experience an increase in steam demand following the proposed project but are not considered modified under NSPS because the Jackson Mill can produce the additional steam without a capital expenditure. The Jackson Mill will continue to comply with the currently applicable provisions of 40 CFR Part 60 Subpart Db after completion of the proposed project.

4.1.2.2 40 CFR Part 60 Subpart BB

The Jackson Mill evaluated the applicability of NSPS Subpart BB to the proposed project. Subpart BB applies to digester systems, brown stock washer systems, multiple-effect evaporator systems, condensate stripper systems, recovery furnaces, smelt dissolving tanks, and lime kilns for which construction, reconstruction, or modification commenced after September 24, 1976 and before May 23, 2013. The proposed No. 2 Brown Stock Washer System is an affected source under Subpart BB because the pre-bleach decker, D_{100} bleach washer, and D-1 bleach washer were constructed in 1996; therefore, Subpart BB is applicable to the proposed project. The Jackson Mill will continue to comply with the currently applicable provisions of 40 CFR Part 60 Subpart BB for the new and existing emission units subject to the regulation after completion of the proposed project.

4.1.2.3 40 CFR Part 60 Subpart BBa

The Jackson Mill evaluated the applicability of NSPS Subpart BBa to the proposed project. Subpart BBa applies to digester systems, brown stock washer systems, multiple-effect evaporator systems, condensate stripper systems, recovery furnaces, smelt dissolving tanks, and lime kilns for which construction, reconstruction, or modification commenced after May 23, 2013. Because emissions of total reduced sulfur (TRS) from the proposed No. 2 Brown Stock Washer System will be controlled by the high-volume low concentration (HVLC) non-condensable gas system, there will be no increase in short-term TRS emissions from this unit and this unit will not trigger NSPS "modification" under 40 CFR 60.14. Furthermore, the No. 2 Brown Stock Washer System will not trigger NSPS "reconstruction" under 40 CFR 60.15 because the fixed capital cost for conversion of the existing washers and filtrate tanks into the No. 2 Brown Stock Washer System is less than 50 percent of the fixed capital cost for construction of a new, similarly sized pulp washing system. None of the new, modified, or affected sources are affected facilities under Subpart BBa; therefore, Subpart BBa is not applicable to the proposed project.

4.1.3 National Emission Standards for Hazardous Air Pollutants (NESHAP)

The EPA has promulgated process-specific standards for control of hazardous air pollutant emissions in 40 CFR Part 63. The Jackson Mill is a major source of hazardous air pollutants because the facility-wide potential to emit HAP is greater than 10 tons per year for several individual HAPs and greater than 25 tons per year for total HAP emissions. The following Part 63 subparts potentially apply to the proposed project:

- 40 CFR Part 63 Subpart S – NESHAP from the Pulp and Paper Industry
- 40 CFR Part 63 Subpart MM – NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills
- 40 CFR Part 63 Subpart DDDDD – NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

4.1.3.1 40 CFR Part 63 Subpart S

NESHAP Subpart S will apply to the proposed No. 2 Brown Stock Washer System. NESHAP Subpart S also applies to several existing sources at the Jackson Mill (e.g., batch digester 6, brown stock washer system, and multiple-effect evaporator system). The proposed project does not change the regulatory applicability of NESHAP Subpart S, and the Jackson Mill will continue to comply with the applicable provisions of 40 CFR Part 63 Subpart S after completion of the proposed project.

4.1.3.2 40 CFR Part 63 Subpart MM

NESHAP Subpart MM is not applicable to the proposed project because the proposed project will not construct or reconstruct any sources subject to NESHAP Subpart MM. NESHAP Subpart MM applies to several existing sources at the Jackson Mill (e.g., recovery furnace, smelt dissolving tank, and lime kiln). The proposed project does not affect the regulatory applicability of NESHAP Subpart MM, and the Jackson Mill will continue to comply with the currently applicable provisions of 40 CFR Part 63 Subpart MM after completion of the proposed project.

4.1.3.3 40 CFR Part 63 Subpart DDDDD

NESHAP Subpart DDDDD establishes emission limits, work practice standards, and testing, monitoring, reporting, and record-keeping requirements that potentially apply to boilers and process heaters located at major sources of HAP. The No. 4 and No. 5 Power Boilers are subject to the tune-up requirements of NESHAP Subpart DDDDD. The proposed project does not affect the regulatory applicability of NESHAP Subpart DDDDD to the No. 4 and No. 5 Power Boilers, and the Jackson Mill will continue to comply with the currently applicable provisions of 40 CFR Part 63 Subpart DDDDD after completion of the proposed project.

4.2 State of Alabama Requirements

The modified and affected emission units associated with the project are potentially subject to the following State of Alabama air regulations that are codified in Division 335-3 of the ADEM Administrative Code:

- Chapter 335-3-4 – Control of Particulate Emissions
- Chapter 335-3-10 – Standards of Performance for New Stationary Sources
- Chapter 335-3-11 – National Emission Standards for Hazardous Air Pollutants
- Chapter 335-3-14 – Air Permits
- Chapter 335-3-16 – Major Source Operating Permits

4.2.1 Chapter 335-3-4 – Control of Particulate Emissions

The No. 1 and No. 3 Paper Machines and the No. 4 and No. 5 Power Boilers are subject to the visible emission limitations of Rule 335-3-4-.01. In addition, the facility is generally subject to the process weight standards in Rule 335-3-4-.04. The proposed project does not affect the regulatory applicability of Chapter 335-3-4 to the No. 1 and No. 3 Paper Machines and the No. 4 and No. 5 Power Boilers, and the Jackson Mill will continue to comply with the currently applicable provisions of Chapter 335-3-4 after completion of the proposed project.

4.2.2 Chapter 335-3-10 – Standards of Performance for New Stationary Sources

Chapter 335-3-10 adopts by reference the federal standards promulgated in 40 CFR Part 60 (see applicability discussion in Section 4.1.2).

4.2.3 Chapter 335-3-11 – National Emission Standards for Hazardous Air Pollutants

Chapter 335-3-11 adopts by reference the federal standards promulgated in 40 CFR Parts 61 and 63 (see applicability discussion in Section 4.1.3).

4.2.4 Chapter 335-3-14 – Air Permits

Chapter 335-3-14 describes the permitting requirements for new and modified sources of air emissions. Rule 335-3-14-.04 addresses Prevention of Significant Deterioration, or New Source Review, permitting requirements and closely resembles the federal New Source Review program. This application has been prepared in accordance with the provisions of Rule 335-3-14-.04. The proposed project will be subject to BACT requirements for VOC as discussed in Section 5. The required ADEM air permit application forms have been completed and are provided in Appendix A.

4.2.5 Chapter 335-3-16 – Major Source Operating Permits

Chapter 335-3-16 implements the federal Title V operating permit program. The Jackson Mill is a major stationary source with respect to Title V and operates in accordance with Permit No. 102-0001 effective October 1, 2020. The Jackson Mill will continue to comply with the provisions of Permit No. 102-0001 and will apply to incorporate the No. 2 Brown Stock Washer System and New Recycled Fiber Plant as emission units in the permit upon completion of construction.

4.3 Ambient Air Quality Impact Analysis Requirements

The ambient limit with which the proposed project must comply is the national ambient air quality standard (NAAQS) for ozone (40 CFR 50.19) of 0.070 parts per million (8-hour average). Analysis of the proposed increase in emissions from Boise's Jackson Mill (see Appendix C) demonstrates that the facility modifications will comply with all state and federal ambient air quality regulations.

SECTION 5

Demonstration of BACT

5.1 Introduction

In Section 3, it has been shown that the project-related emission increases for VOC and CO_2e are greater than the respective PSD significant emission rates for these pollutants. The modifications proposed in this application are therefore considered to be major as defined in Alabama Administrative Code R. 335-3-14-.04. A demonstration of best available control technology (BACT) is therefore required in support of the PSD permit application for the proposed modifications to the No. 1 and No. 3 Paper Machines and the proposed construction of the new Recycled Fiber Plant.

Pursuant to ADEM Administrative Code R. 335-3-14-.04(9)(c), BACT demonstrations are not required for emission units that are affected but not physically modified. Therefore, BACT demonstrations are not required for VOC and CO_2e emissions from the No. 4 and No. 5 Power Boilers or for VOC emissions from the Tall Oil Plant. VOC is the only pollutant for which a BACT demonstration is required. The proposed project includes the physical modification of the No. 1 Paper Machine, the No. 3 Paper Machine, the existing Deink Plant, the existing pre-bleach decker and D_{100} and D-1 bleach washers and associated filtrate tanks, and construction of a new Recycled Fiber Plant. Because modifications to the existing Deink Plant and the existing pre-bleach decker and D_{100} and D-1 bleach washers and associated filtrate tanks will not result in a VOC emissions increase, BACT demonstrations are not required for the Deink Plant or the No. 2 Brown Stock Washer System.

5.2 Methodology

To determine BACT, the U.S. Environmental Protection Agency (EPA) recommends a pollutant-specific "top-down" analysis for each affected emission source associated with the proposed action. The first step in the analysis is to identify, for each emission source, the most stringent emission control available to a similar unit. If it can be shown that this level of emission control is technically or economically infeasible, then the next most stringent emission control is determined and similarly evaluated. This process continues until the

BACT level of emission control cannot be eliminated. Listed below are the five basic steps of the "top-down" analysis:

Step 1. Identify available control technologies;

Step 2. Eliminate technically infeasible options;

Step 3. Rank remaining control technologies by control effectiveness;

Step 4. Evaluate the most effective controls and document results. A case-by-case evaluation of energy, environmental, and economic impacts is performed for each remaining control technology;

Step 5. Identify BACT.

A general review of the U. S. EPA Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC) database has been performed for similar sources to identify emission control strategies relevant to the proposed project. An extensive review of the RBLC defined the range of potentially applicable emission control applications. However, the control technologies evaluated in the "top-down" analysis were not limited to the controls listed in the RBLC. The BACT analysis was performed with the following considerations:

- The BACT review for the No. 1 and No. 3 Paper Machines was limited to all unbleached Kraft paper machine BACT listings in the past 15 years.
- The BACT review for the new Recycled Fiber Plant was not limited to a specific timeframe because of the low number of results that were published in the RBLC for this type of source.

The VOC BACT demonstrations for the No. 1 and No. 3 Paper Machines and the new Recycled Fiber Plant are provided in the following subsections.

5.3 VOC BACT Analysis for Paper Machines

Paper machines emit VOC from various operations within the paper machine itself. VOCs can be emitted from the addition of chemical-containing additives to the paper-forming process. In addition, other VOC emissions, including methanol and terpenes, are carried over from the Kraft pulp manufacturing process in the paper machine whitewater and can be released during paper forming. The projected actual emissions of the No. 1 and No. 3 Paper Machines are provided in Table 3-1, and account only for VOC emissions from the paper forming process. Because no coatings are applied in the No. 1 and No. 3 Paper Machines, VOC emissions are not emitted from any coating processes at the Jackson Mill. This section provides the VOC BACT evaluation for the No. 1 and No. 3 Paper Machines.

5.3.1 Step 1 – Identify Available Control Technologies

PCA has researched the U. S. EPA's RBLC to identify existing Kraft paper machines that had VOC control determinations. The search results provided the following technologies that were adopted as BACT for Kraft paper machine VOC emissions:

- Use of Low-VOC materials and additives; and
- Good operating practices.

PCA considers good operating practices for the Jackson Mill's No. 1 and No. 3 Paper Machines to include the use of low-VOC or non-VOC containing materials and additives and already incorporates good operating practices for the paper machines through the mill's new product chemical approval system. These technologies have been combined in this BACT demonstration.

A review of recent PSD applications for Kraft paper machines submitted by other facilities assisted PCA with identification of the following additional VOC control technologies:

- Thermal oxidation;
- Catalytic oxidation;
- Carbon adsorption;
- Wet scrubbers; and
- Biofiltration.

5.3.2 Step 2 – Eliminate Technically Infeasible Options

Four control technology options were considered to be technically infeasible as described in the following subjections. The technically infeasible options include:

- Carbon adsorption;
- Wet scrubbers;

- Biofiltration; and
- Catalytic oxidation.

5.3.2.1 Carbon Adsorption

Carbon adsorption utilizes an activated carbon bed to adsorb VOC from a VOC-containing stream. The VOC is adsorbed onto the surface of the carbon and requires regeneration after saturation. Regeneration involves the use of steam or hot air to collect the condensed VOC to be further treated by incinerator or other control equipment. The control efficiency is approximately 95 percent and is dependent on the concentration of the VOC, conditions of the gas stream, and the ability of the carbon to adsorb specific VOC compounds present in the gas stream. Challenges with using carbon adsorption for a paper machine exhaust gas stream are particulate matter, temperature, and moisture content. Particulate matter can clog the pores of the activated carbon and greatly reduce the VOC removal efficiency; therefore, particulate matter would have to be removed from the gas stream before treatment by carbon adsorption. Additionally, exhaust gas streams from paper machines do not meet the proper conditions, including low moisture content and temperature below 150°F, for carbon adsorption to be effective. Carbon adsorption is therefore considered technically infeasible.

5.3.2.2 Wet Scrubbers

Wet scrubbers are utilized in many vent processes to filter the vent stream of pollutants and particulates. A wet scrubber operates by spraying a wet media (scrubber solution) from the top of a vent while the gas being filtered enters the wet media from below. As the gas contacts the liquid, the scrubber solution contacts the pollutants being filtered and entrains these pollutants in the wet media. The scrubber solution is then typically cleaned and recycled through the system. Venturi scrubbers are the most commonly used scrubbers due to high collection efficiency estimated at 99 percent for particulate matter. For removal of VOC a scrubbing reagent would have to be designed specifically for the pollutants in paper machine exhaust gases; therefore, VOC removal efficiency is unknown. Currently, the use of a wet scrubber for paper machine exhaust gas has not been demonstrated for VOC reduction and this technology is not listed in the RBLC database. Wet scrubbers are considered technically infeasible for the control of paper machine VOC emissions.

5.3.2.3 Biofiltration

Biofiltration utilizes microorganisms in a filter bed to break down organic compounds into carbon dioxide, water, and salts from a VOC-containing stream. Multiple parameters such as temperature, oxygen level, and pH must be considered when using microorganisms. The optimal temperature is between 85°F and 105°F for microorganisms to metabolize the VOC. The exhaust gases from paper machines are typically higher than 105°F and would kill the bacteria contained in the filter media. Cooling of the exhaust gases would require large heat exchangers or large amounts of diluted air. Therefore, VOC reduction via biofiltration is considered technically infeasible.

5.3.2.4 Catalytic Oxidation

Catalytic oxidizers use a catalyst to promote the oxidation of VOCs to carbon dioxide and water. Catalyst beds are located in the exhaust duct just downstream of the combustion chamber where temperatures are sufficiently high for reaction. Catalytic oxidation is considered to be technically infeasible because of the high moisture content in paper machine exhaust gases, particularly those associated with the wet end of the paper machine where the initial paper forming occurs. The high moisture level in the exhaust gases adversely affects the catalyst performance.

5.3.3 Step 3 – Rank Remaining Control Technologies by Effectiveness

The remaining technically feasible control options for paper machine VOC emissions are thermal oxidation and good operating practices. The technically feasible control options have been ranked by control effectiveness in Table 5-1 below.

Table 5-1. VOC Control Technology Ranking for Paper Machine Conversion Project

Control Technology Option	Control Efficiency	Rank
Thermal Oxidation	98%	1
Good Operating Practices	Varies	2

5.3.3.1 Thermal Oxidation

Thermal oxidation combusts VOC streams with a control efficiency of greater than or equal to 98 percent and can be used for control of any VOC-containing streams. The temperature required for combustion is typically 1,400°F to 1,600°F. Thermal oxidation is ranked as the top-level control. While VOC emissions are destroyed by thermal oxidation, other combustion emissions (e.g., NOx, CO, and CO2e) are created and released to atmosphere.

5.3.3.2 Good Operating Practices

Good operating practices involve the use of low-VOC or non-VOC containing materials and additives and have already been implemented by the Jackson Mill. Good operating practices is ranked as the second most effective control technology.

5.3.4 Step 4 – Evaluate Economic, Environmental and Energy Impacts of Technically Feasible Control Technologies

5.3.4.1 Thermal Oxidation

Thermal oxidation technologies include regenerative, recuperative, and direct thermal oxidation. Regenerative thermal oxidation includes heat recovery and would be the most practical and cost-effective thermal oxidation technology for controlling VOC emissions from paper machines.

Regenerative thermal oxidation would require the collection of a large volume of exhaust gases containing very low concentrations of VOC from various paper machine locations prior to treatment. Based upon data supplied by the Jackson Mill to the U. S. EPA as part of the information collection request for the *National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry – 40 CFR Part 63 Subpart S* residual risk evaluation, the total vent gas flow from the No. 1 and No. 3 Paper Machines is approximately 356,000 and 709,000 actual cubic feet per minute (ACFM), respectively. The estimated cost for a regenerative thermal oxidizer (RTO) for a paper machine similar to the No. 1 Paper Machine is provided in Table 5-2 below. The paper machine represented by the data in the table exhausts only 31 percent of the combined total gas volume that is exhausted by the No. 1 and No. 3 Paper Machines. It is reasonable to conclude that the installation of an RTO to control VOC emissions from the No. 1 and No. 3 Paper Machines would cost substantially more based on the higher volume of gases to be handled.

Table 5-2. Cost Estimate for RTO to Control Paper Machine Emissions					
Source Description	**Exhaust Gas Flow Into RTO (ACFM)**	**RTO Equipment Price**	**Auxiliary Equipment Price**	**Total Purchased Equipment Price**	**Estimated Installed Cost**
Paper Machine	327,717	$9,700,000	$3,900,000	$13,600,000	$34,000,000

The cost estimate in Table 5-2 does not include operating, maintenance, utility or overhead costs associated with the operation of an RTO. Scaling the installed cost to reflect a thermal oxidizer large enough to control emissions from both the No. 1 and No. 3 Paper Machines, the estimated installed cost would be $69,000,000. Assuming a 10-year life expectancy for an RTO at a 7% interest rate, the annual capital recovery cost for $69,000,000 is approximately $9,800,000. Without including any of the additional costs associated with operating the RTO, the cost for controlling 98% of the projected 393.3 tons per year of VOC from the No. 1 and No. 3 Paper Machines is more than $25,400 per ton.

5.3.4.2 Good Operating Practices

The Jackson Mill currently uses good operating practices for the No. 1 and No. 3 Paper Machines and a cost control analysis was not conducted for this control alternative. Good operating practices for the No. 1 and No. 3 Paper Machines include preventive maintenance on all of the paper machine equipment and systems, the use of low-VOC or non-VOC containing materials and additives to the extent practical, and a new chemical product review and approval program. The Jackson Mill does not anticipate any additional economic, environmental, or energy impacts associated with this control technique.

5.3.5 Step 5 – Proposed BACT

The Jackson Mill is proposing VOC BACT for the No. 1 and No. 3 Paper Machines to be good operating practices to minimize VOC emissions. These practices include preventive maintenance on all of the paper machine equipment and systems, the use of low-VOC or non-VOC containing materials and additives to the extent practical, and use of the mill's new chemical product review and approval program.

Table 5-3 summarizes the information gathered by PCA from EPA's RBLC in support of this BACT evaluation. The information summarizes the RBLC information for Kraft paper machines permitted since January 1, 2006. Bleached paper and tissue machines were not included in this summary.

5.4 Recycle Plant VOC BACT Demonstration

The new Recycled Fiber Plant has the potential to emit VOC during the OCC and DLK repulping process. The potential emissions of the new Recycled Fiber Plant are provided in Table 3-1. This section provides the VOC BACT evaluation for the Recycled Fiber Plant.

5.4.1 Step 1 – Identify Available Control Technologies

PCA has researched the U. S. EPA's RBLC to identify existing sources with OCC recycle plants that had VOC BACT entries. The search yielded only three results, with two of them having no emission limit information available. The following control technologies were identified as potentially available options for reducing emissions of VOC from OCC/DLK recycle plants:

- Capture and control with an add-on control device, and
- Good operating practices.

5.4.2 Step 2 – Eliminate Technically Infeasible Options

PCA evaluated the possibility of capturing VOC emissions from the new Recycled Fiber Plant and conveying the collected gases to an add-on VOC control device. The layout of the new Recycled Fiber Plant is still currently being engineered and designed, but it is expected to include numerous building vents and one or more dedicated process exhaust stacks. The exhaust gases from the new Recycled Fiber Plant are expected to contain very low concentrations of VOC. For the purpose of this BACT evaluation, the Jackson Mill has considered the collection and control of exhaust gases from multiple roof and process vents to be technically feasible. However, PCA has not distinguished between the various types of available add-on control technologies.

Table 5-3. Summary of RBLC Database for Similar Paper Machine VOC Emission Limits Since January 1, 2006

RBLC ID	Permit Issuance Date	Facility Name	Unit	Throughput	Throughput Units	Emission Limit	Emission Limit Units	Emission Limit (tpy)	Control
WA-0303	11-1-2006	LongView Fibre Paper and Packaging, Inc.	Paper Machines	3,600	MDT/day	-	-	-	Use of low VOC additives
OK-0123	4-25-2008	International Paper Valliant Paper Mill – Valliant, OK	Paper Machines	-	-	-	-	-	Good operating practices
AL-0270	6-11-2014	Georgia-Pacific Brewton LLC – Brewton, AL	No. 2 Paper Machine	1,348	MDT/day	0.51	lb/ADTFP	134.0	Use low VOC materials
LA-0322	5-11-2017	Hood Container of Louisiana LLC – St. Francisville, LA	No. 1 Paper Machine	375,000	ADTFP/yr	0.622	lb/ADTFP	116.7	Good operating practices, including use of low VOC additives
AL-0324	3-16-2018	International Paper Riverdale Mill – Selma, AL	No. 15 Paper Machine	598,690	ADTFP/yr	0.764	lb/ADTFP	228.59	Good operating practices, including use of low VOC additives
ME-0043	5-15-2018	Verso Androscoggin LLC – Jay, ME	No. 3 Paper Machine	-	-	-	-	69.81	Good operating practices
			No. 5 Paper Machine	-	-	-	-	6.95	Good operating practices
AR-0161	9-23-2019	Sun Bio Material Company – Arkadelphia, AR*	No. 1 Paper Machine	2,500	MDT/day			245	Use low VOC materials; no wet end slurry additives will be used
			No. 2 Paper Machine	1,900	MDT/day			186	Use low VOC materials; no wet end slurry additives will be used

*Greenfield Kraft pulp and linerboard mill

5.4.3 Step 3 – Rank Remaining Control Technologies by Effectiveness

Because neither of the control options identified in Step 1 were eliminated in Step 2, they have been ranked by control effectiveness in Table 5-4 below.

Table 5-4. VOC Control Technology Ranking for Recycled Fiber Plant

Control Technology Option	Control Efficiency	Rank
Add-On Controls	95-99%	1
Good Operating Practices	Varies	2

5.4.4 Step 4 – Evaluate Economic, Environmental and Energy Impacts of Technically Feasible Control Technologies

Add-on technologies for VOC control could include several options (e.g., thermal oxidation, carbon adsorption, etc.). The proposed Recycled Fiber Plant has very low potential VOC emissions (1.83 tons/year). Because most of the emission generating activities are fugitive (e.g., building ventilation), the associated volume of exhaust gases requiring capture and control is expected to be very high. Any add-on control technology would be extremely costly and is not considered to be economically feasible. For demonstration purposes, if it is assumed that the add-on control can be installed for $1,000,000 and also assuming a 10-year life expectancy for the add-on control at a 7% interest rate, the annual capital recovery cost is approximately $142,000. Without including any of the additional costs associated with operating the add-on control, the cost for controlling 99% of the projected 1.83 tons per year of VOC from the Recycled Fiber Plant is more than $78,000 per ton. Therefore, a more detailed cost analysis for specific add-on control technologies has not been prepared.

For good operating practices, the Jackson Mill does not anticipate any additional economic, environmental, or energy impacts associated with this control technique. Good operating practices was identified as the only control technique that is economically feasible.

5.4.5 Step 5 – Proposed BACT

The Jackson Mill is proposing VOC BACT for the Recycled Fiber Plant to be good operating practices to minimize VOC emissions. These practices include preventive maintenance on all recycle plant equipment and systems, the use of low-VOC or non-VOC containing materials to the extent practical, and use of the mill's new chemical product review and approval program. Table 5-5 summarizes the information gathered from EPA's RBLC in support of this BACT evaluation.

Table 5-5. Summary of RBLC Database for OCC Recycling Plant VOC Emission Limits

RBLC ID	Permit Issuance Date	Facility Name	Unit	Emissions Limit (tpy)	Control
OK-0084	6-8-1999	Valliant Mill	No. 3 OCC Plant	11.7	None
OK-0103	10-13-2004	Weyerhaeuser-Valliant	OCC Plants (3)	-	Good operating practices
OK-0123	4-24-2008	IP-Valliant Paper Mill	OCC Plant	-	Good operating practices

5.5 BACT Summary

No add-on control technologies were identified as feasible for the No. 1 Paper Machine, the No. 3 Paper Machine, or the Recycled Fiber Plant from an economic, environmental, and energy impact perspective. PCA therefore proposes that VOC BACT for these sources consist of the use of good operating practices for each unit.

APPENDIX A

Permit Application Forms

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT (AIR DIVISION)

Do not Write in This Space

Facility Number [| |] - [| | |]

CONSTRUCTION/OPERATING PERMIT APPLICATION
FACILITY IDENTIFICATION FORM

1. Name of Facility, Firm, or Institution: **Boise White Paper, LLC – Jackson Mill**

Facility Physical Location Address

Street & Number: **4585 Industrial Road**

City: **Jackson** County: **Clarke** Zip: **36545**

Facility Mailing Address (If different from above)

Address or PO Box:

City: State: Zip:

Owner's Business Mailing Address

2. Owner: **Boise White Paper, LLC**

Street & Number: **4585 Industrial Road** City: **Jackson**

State: **Alabama** Zip: **36545** Telephone: **(251) 246-4461**

Responsible Official's Business Mailing Address

3. Responsible Official: **Derek Fleischman** Title: **Mill Manager**

Street & Number: **4585 Industrial Road**

City: **Jackson** State: **Alabama** Zip: **36545**

Telephone Number: **(251) 246-4461** E-mail Address: **DFleischman@packagingcorp.com**

Plant Contact Information

4. Plant Contact: **Thomas Brett Horton** Title: **Senior Environmental Engineer**

Telephone Number: **(251) 246-8242** E-mail Address: **BrettHorton@packagingcorp.com**

5. Location Coordinates:

UTM: **3,484,242 meters** E-W **414,619 meters** N-S

Latitude/Longitude: **31° 29' 23"** Lat **-087° 53' 56"** Long

6. Permit application is made for:

☐Existing source (initial application)

☒Modification

☐New source (to be constructed)

☐Change of ownership

☐Change of location

☐Other (specify) ____________________

☐Existing source

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

To Be Determined

____

____________________ Telephone ____________________

Date construction/modification to begin **April 15, 2021** to be completed **December 31, 2022**

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

☒Air permit

☐Major source operating permit

☐Synthetic minor source operating permit

☐General permit

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

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

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

SIC: 2621 – Paper (except newsprint) Mills and 2611 – Pulp Mills

NAICS: 322121 – Paper (except newsprint) Mills

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
Not Applicable		

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

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

Emission unit or source: **Not Applicable**

(description)

				Compliance Status	
Pollutant[4]	Standard	Program[1]	Method used to determine compliance	IN[2]	OUT[3]

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

[2]Attach compliance plan

[3]Attach compliance schedule (ADEM Form-114)

[4]Fugitive emissions must be included as separate entries

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

Insignificant Activity	Basis
Not Applicable	

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

a. **Not Applicable**

b.

c.

d.

e.

f.

g.

h.

i.

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

a. **Supporting Emission Calculations**

b. **Permit Application Forms**

c.

d.

e.

f.

g.

h.

i.

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

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

[signature]	Mill Manager	12-28-2020
SIGNATURE OF RESPONSIBLE OFFICIAL	TITLE	DATE

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
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1. Name of firm or organization: **Boise White Paper, LLC – Jackson Mill**

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 **N/A**

   The Jackson Mill proposes to modify the No. 1 Paper Machine to produce unbleached Kraft paper and/or corrugated medium from virgin unbleached Kraft pulp, recycled old corrugated container and doubled lined Kraft pulp.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): **No. 1 Paper Machine**

   Make: **Allis Chalmers** Model: **Fourdrinier**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: **50,000***

   Manufactured date: **1966** Proposed installation date: **N/A**

   Original installation date (if existing): **1966**

   Reconstruction or Modification date (if applicable): **2021**

4. Normal operating schedule:

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

   Peak production season (if any): **N/A**

***Capacity is expressed in machine-dry pounds per hour of unbleached Kraft paper produced.**

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

Material	Process weight average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Unbleached Kraft Pulp	**50,000 lb/hr**	**50,000**	**219,000**
(Virgin and/or Recycled)			

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

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

7. Products of process or unit:

Products	Quantity/year	Units of production
Unbleached Kraft Paper	**219,000**	**Machine-Dry Tons**

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
Only mill supply water, non-direct contact condensates, clean condensates, or white water may be used as water sources for the paper machine.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

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

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
X026-A	**414.647**	**3484.489**	**80**	**45**	**5.5**	**43.49**	**62,000**	**180**
X026-B	**414.647**	**3484.495**	**80**	**45**	**5.5**	**43.49**	**62,000**	**180**
X026-C	**414.647**	**3484.512**	**80**	**45**	**5.5**	**43.49**	**62,000**	**180**

* std temperature is 68°F - std pressure is 29.92" in hg.

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

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(Tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
X026	**Filterable PM**	**0.63**	**2.74**	**NCASI Emission Factor**	**N/A**	**N/A**
X026	**Total PM-10**	**0.85**	**3.72**	**NCASI Emission Factor**	**N/A**	**N/A**
X026	**Total PM-2.5**	**0.68**	**2.96**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Volatile Organic Compounds**	**89.8**	**393.25**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Total HAPs**	**24.4**	**106.8**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Acetaldehyde**	**1.38**	**6.04**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Biphenyl**	**1.22**	**5.36**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Methanol**	**17.6**	**77.2**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Methylene Chloride**	**0.51**	**2.25**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Phenol**	**0.40**	**1.73**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Tetrachloroethylene**	**0.39**	**1.69**	**NCASI Emission Factor**	**N/A**	**N/A**

***Combined emissions for No. 1 and No. 3 Paper Machines**

12. Using a flow diagram:

(1) Illustrate input of raw materials,

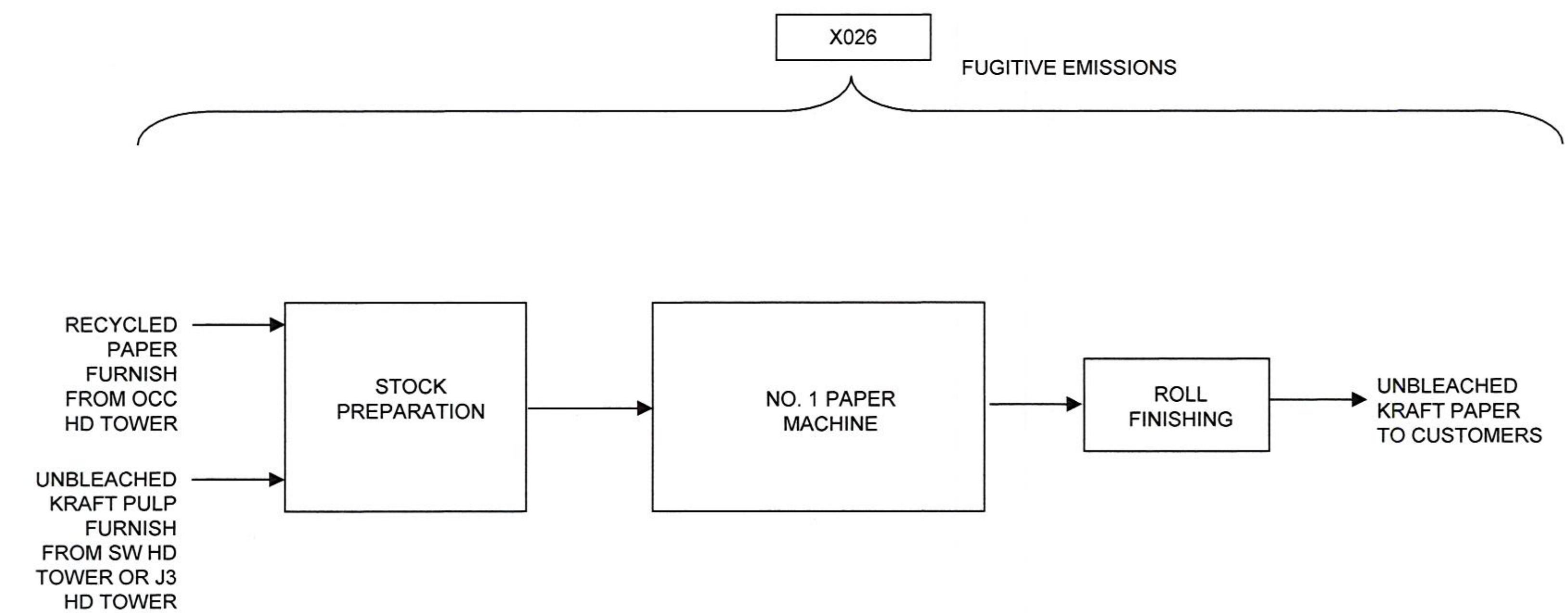
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

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

☐ (Check box if extra pages are attached)

Process flow diagram

See attached process flow diagram



NO. 1 PAPER MACHINE PROCESS FLOW DIAGRAM

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

☒yes ☐no

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

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

☐yes ☒no

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

☐yes ☐no **Not Applicable**

List storage piles or other facility (if any):

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

Name of person preparing application: **Thomas Brett Horton, Senior Environmental Engineer**

Signature: Brett Horton Date: 12-28-20

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

			-					-				

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1. Name of firm or organization: **Boise White Paper, LLC – Jackson Mill**

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 **N/A**

   The Jackson Mill proposes to modify the No. 3 Paper Machine to produce unbleached Kraft linerboard from virgin unbleached Kraft pulp and recycled old corrugated container and doubled lined Kraft pulp.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): **No. 3 Paper Machine**

   Make: **Valmet** Model: **Fourdrinier**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: **208,333***

   Manufactured date: **1996** Proposed installation date: **N/A**

   Original installation date (if existing): **1997**

   Reconstruction or Modification date (if applicable): **Jan 2022**

4. Normal operating schedule:

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

   Peak production season (if any): **N/A**

***Capacity is expressed in machine-dry pounds per hour of unbleached Kraft linerboard.**

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

Material	Process weight average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Unbleached Kraft Pulp	**208,333 lb/hr**	**208,333**	**912,500**
(Virgin and/or Recycled)			

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

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

7. Products of process or unit:

Products	Quantity/year	Units of production
Kraft Linerboard	**912,500**	**Machine-Dry Tons**

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
Only mill supply water, non-direct contact condensates, clean condensates, or white water may be used as water sources for the paper machine.

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

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

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (ºF)
	E-W (km)	N-S (km)						
X027-A	**414.870**	**3484.478**	**67**	**45**	**5.5**	**54.72**	**78,000**	**180**
X027-B	**414.870**	**3484.497**	**67**	**45**	**5.5**	**54.72**	**78,000**	**180**
X027-C	**414.869**	**3484.509**	**67**	**45**	**5.5**	**54.72**	**78,000**	**180**
X027-D	**414.869**	**3484.517**	**67**	**45**	**5.5**	**54.72**	**78,000**	**180**
X027-E	**414.869**	**3484.536**	**67**	**45**	**5.5**	**54.72**	**78,000**	**180**

* std temperature is 68ºF - std pressure is 29.92" in hg.

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

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
X027	**Filterable PM**	**2.60**	**11.4**	**NCASI Emission Factor**	**N/A**	**N/A**
X027	**Total PM-10**	**3.54**	**15.5**	**NCASI Emission Factor**	**N/A**	**N/A**
X027	**Total PM-2.5**	**2.81**	**12.3**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Volatile Organic Compounds**	**89.8**	**393.25**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Total HAPs**	**24.4**	**106.8**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Acetaldehyde**	**1.38**	**6.04**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Biphenyl**	**1.22**	**5.36**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Methanol**	**17.6**	**77.2**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Methylene Chloride**	**0.51**	**2.25**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Phenol**	**0.40**	**1.73**	**NCASI Emission Factor**	**N/A**	**N/A**
X026 + X027*	**Tetrachloroethylene**	**0.39**	**1.69**	**NCASI Emission Factor**	**N/A**	**N/A**

***Combined emissions for No. 1 and No. 3 Paper Machines**

12. Using a flow diagram:

(1) Illustrate input of raw materials,

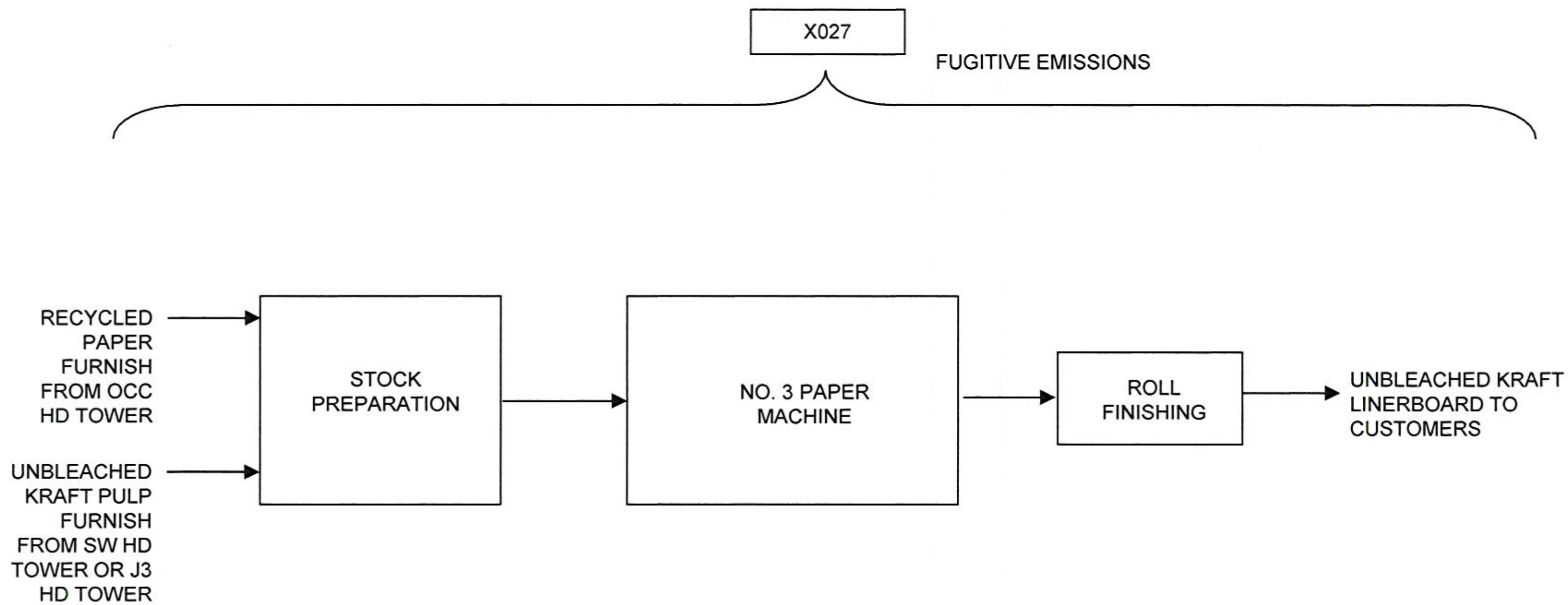
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,

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

☐ (Check box if extra pages are attached)

Process flow diagram

See attached process flow diagram



NO. 3 PAPER MACHINE PROCESS FLOW DIAGRAM

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

☒yes ☐no

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

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

☐yes ☒no

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

☐yes ☐no **Not Applicable**

List storage piles or other facility (if any):

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

Name of person preparing application: **Thomas Brett Horton, Senior Environmental Engineer**

Signature: Brett Horton Date: 12-28-20

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. Name of firm or organization: **Boise White Paper, LLC – Jackson Mill**

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 **N/A**

   The Jackson Mill proposes to convert the existing Deink Plant into a recycled fiber plant that uses pre- and post-consumer materials including old corrugated container and double-lined Kraft fiber. Bales of the material to be recycled are conveyed to a pulper where hot water is added and the mixture is agitated to break the material down into papermaking fibers. The resulting fiber slurry is cleaned and thickened prior to being used used in the papermaking process.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): **No. 1 Recycle Plant**

   Make: **Andritz** Model: **3616**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: **25,000***

   Manufactured date: **1994** Proposed installation date: **N/A**

   Original installation date (if existing): **June 1995**

   Reconstruction or Modification date (if applicable): **2021**

4. Normal operating schedule:

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

   Peak production season (if any): **N/A**

***Capacity is expressed in pounds per hour of recycled pulp produced (dry basis).**

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

Material	Process weight average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Recycled Fiber Furnish	**300 tons/day**	**25,000**	**109,500**
(OCC and DLK Material)			

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

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

7. Products of process or unit:

Products	Quantity/year	Units of production
Recycled Fiber	**109,500**	**Air-Dry Tons**

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
Not Applicable

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

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

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
X028	**414.844**	**3484.325**	**25**	**45**	**N/A (Fugitive)**	**N/A (Fugitive)**	**N/A (Fugitive)**	**100**

* std temperature is 68°F - std pressure is 29.92" in hg.

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

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
X028	**Volatile Organic Compounds**	**0.10**	**0.44**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**1,2-Dimethoxyethane (Glycol Ethers)**	**0.00050**	**0.0022**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Acetaldehyde**	**0.015**	**0.064**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Biphenyl**	**0.0048**	**0.021**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Carbon Disulfide**	**0.020**	**0.087**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Chloroform**	**0.00062**	**0.0027**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Formaldehyde**	**0.0017**	**0.0076**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Methanol**	**0.032**	**0.14**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Methylene Chloride**	**0.0021**	**0.0092**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Phenol**	**0.0039**	**0.017**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Propionaldehyde**	**0.0018**	**0.0078**	**NCASI Emission Factor**	**N/A**	**N/A**
X028	**Toluene**	**0.020**	**0.088**	**NCASI Emission Factor**	**N/A**	**N/A**

12. Using a flow diagram:

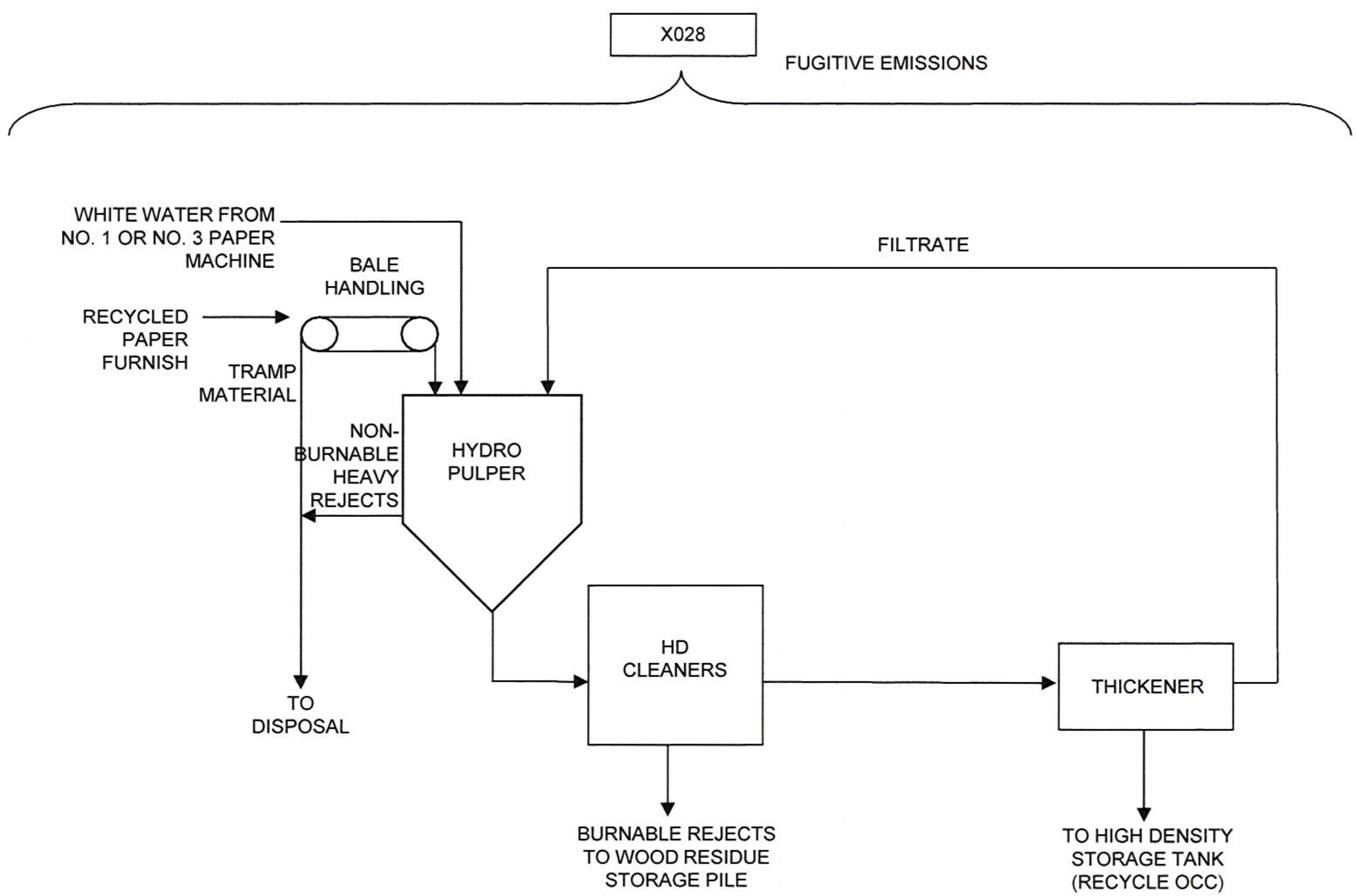
(1) Illustrate input of raw materials,

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

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

☒ (Check box if extra pages are attached)

See attached process flow diagram



NO. 1 RECYCLE PLANT PROCESS FLOW DIAGRAM

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

☒yes ☐no

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

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

☐yes ☒no

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

☐yes ☐no **Not Applicable**

List storage piles or other facility (if any):

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

Name of person preparing application: **Thomas Brett Horton, Senior Environmental Engineer**

Signature: Brett Horton Date: 12-28-20

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

| | - | | - | |

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1. Name of firm or organization: **Boise White Paper, LLC – Jackson Mill**

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 **N/A**

   The Jackson Mill proposes to construct a new recycled fiber plant that uses pre- and post-consumer materials including old corrugated container and double-lined Kraft fiber. Bales of the material to be recycled are conveyed to a pulper where hot water is added and the mixture is agitated to break the material down into papermaking fibers. The resulting fiber slurry is cleaned and thickened prior to being used in the papermaking process.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): **No. 2 Recycle Plant**

   Make: **To Be Determined** Model: **To Be Determined**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: **104,167***

   Manufactured date: **2021** Proposed installation date: **2021**

   Original installation date (if existing): **N/A**

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

4. Normal operating schedule:

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

   Peak production season (if any): **N/A**

***Capacity is expressed in pounds per hour of recycled pulp produced (dry basis).**

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

Material	Process weight average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Recycled Fiber Furnish	**1,250 tons/day**	**104,167**	**456,250**
(OCC and DLK Material)			

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

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

7. Products of process or unit:

Products	Quantity/year	Units of production
Recycled Fiber	**456,250**	**Air-Dry Tons**

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
Not Applicable

9. Is there any emission control equipment on this emission source?
☐Yes ☒No (Where a control device exists, Form ADEM-110 must be completed and attached).

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

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
X033	**414.800**	**3484.200**	**40**	**45**	**N/A (Fugitive)**	**N/A (Fugitive)**	**N/A (Fugitive)**	**100**

* std temperature is 68°F - std pressure is 29.92" in hg.

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

Emission Point	Pollutants	Potential Emissions (lb/hr)	(Tons/yr)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	(units of standard)
X033	**Volatile Organic Compounds**	**0.42**	**1.83**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**1,2-Dimethoxyethane (Glycol Ethers)**	**0.0020**	**0.0090**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Acetaldehyde**	**0.060**	**0.26**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Biphenyl**	**0.020**	**0.086**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Carbon Disulfide**	**0.082**	**0.36**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Chloroform**	**0.0026**	**0.011**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Formaldehyde**	**0.0072**	**0.031**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Methanol**	**0.13**	**0.58**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Methylene Chloride**	**0.0088**	**0.038**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Phenol**	**0.016**	**0.070**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Propionaldehyde**	**0.0074**	**0.033**	**NCASI Emission Factor**	**N/A**	**N/A**
X033	**Toluene**	**0.083**	**0.37**	**NCASI Emission Factor**	**N/A**	**N/A**

12. Using a flow diagram:

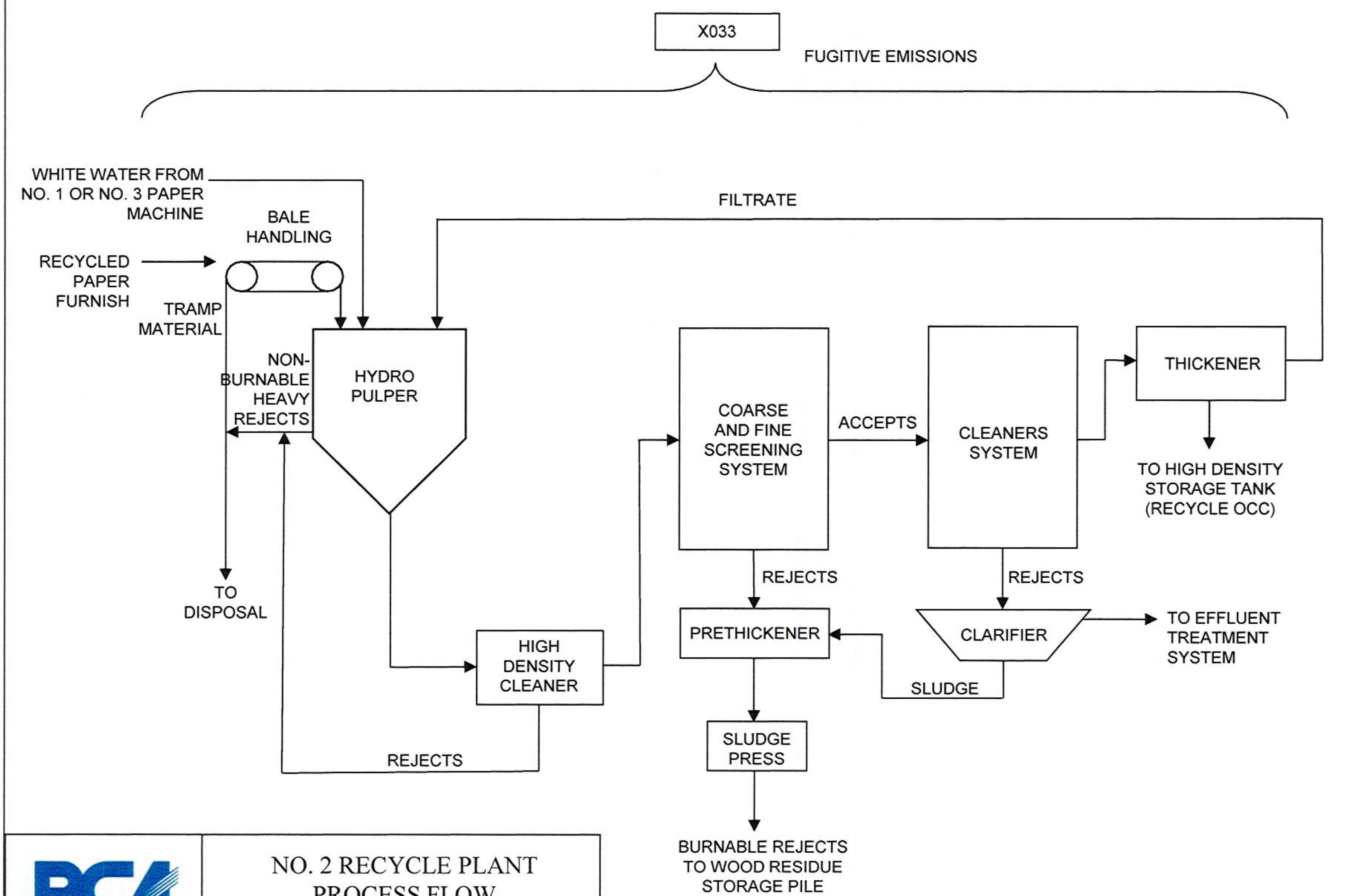
(1) Illustrate input of raw materials,

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

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

☒ (Check box if extra pages are attached)

See attached process flow diagram



NO. 2 RECYCLE PLANT PROCESS FLOW DIAGRAM

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

☒yes ☐no

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

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

☐yes ☒no

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

☐yes ☐no **Not Applicable**

List storage piles or other facility (if any):

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

Name of person preparing application: **Thomas Brett Horton, Senior Environmental Engineer**

Signature: Brett Horton Date: 12-28-20

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[| |] - [| | |] - [| | |]
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1. Name of firm or organization: **Boise White Paper, LLC – Jackson Mill**

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 **N/A**

   The Jackson Mill proposes to convert the existing pre-bleach decker and D100 and D-1 stage washers from the Bleach Plant into a second Kraft pulp washing system. In the pulp washing system, Kraft pulp from the batch digester system is passed over a series of rotary drum vacuum washers to remove spent pulping liquor from the pulp. The pulp washing system consists of a counter-current flow sequence with the unwashed pulp entering the first washer stage and the cleanest shower water entering the last washer stage. Each drum uses filtrate from the next stage to wash the pulp as it is thickened on the cylinder. Exhaust gases from the vacuum washers and filtrate tanks are collected in the HVLC system and burned in the Combination Boiler.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): **No. 2 Pulp Washing System**

   Make: **IMPCO** Model: **Custom**

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: **66,667***

   Manufactured date: **1996** Proposed installation date: **N/A**

   Original installation date (if existing): **1996**

   Reconstruction or Modification date (if applicable): **Jan 2022**

4. Normal operating schedule:

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

   Peak production season (if any): **N/A**

***Capacity is expressed in pounds of air-dry softwood pulp per hour produced.**

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

Material	Process weight average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Softwood Kraft Pulp	**800 ADTP/day**	**66,667**	**292,000**

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

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

7. Products of process or unit:

Products	Quantity/year	Units of production
Softwood Pulp	**292,000**	**Air-Dry Tons of Pulp**
Black Liquor Solids	**301,679**	**Tons (Dry BLS Equivalent)**

8. For each regulated pollutant, describe any limitations on source operation which affects emissions or any work practice standard (attach additional page if necessary):
HVLC gases must be captured and conveyed to a boiler or lime kiln for thermal destruction at a minimum temperature of 1,200 °F and a minimum residence time of 0.5 second.

9. Is there any emission control equipment on this emission source?
☒Yes ☐No (Where a control device exists, Form ADEM-110 must be completed and attached).

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

Emission Point	Stack							
	UTM Coordinates		Height Above Grade (Feet)	Base Elevation (Feet)	Diameter (Feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						
Z013 (Primary)	**414.648**	**3484.269**	**200**	**45**	**8.0**	**53.4**	**161,000**	**158**
Z011 (N) (Backup)	**414.621**	**3484.247**	**221**	**45**	**7.5**	**43.8**	**116,000**	**326**
Z011 (S) (Backup)	**414.621**	**3484.240**	**221**	**45**	**7.5**	**43.8**	**116,000**	**326**

* std temperature is 68°F - std pressure is 29.92" in hg.

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

Emission Point	Pollutants	Potential Emissions (lb/hr)	Potential Emissions (Tons/yr)	Potential Emissions Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
X034**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

****No. 2 pulp washing system emissions are collected in the HVLC closed-vent system for thermal destruction in the Combination Boiler or No. 2 Recovery Furnace.**

12. Using a flow diagram:

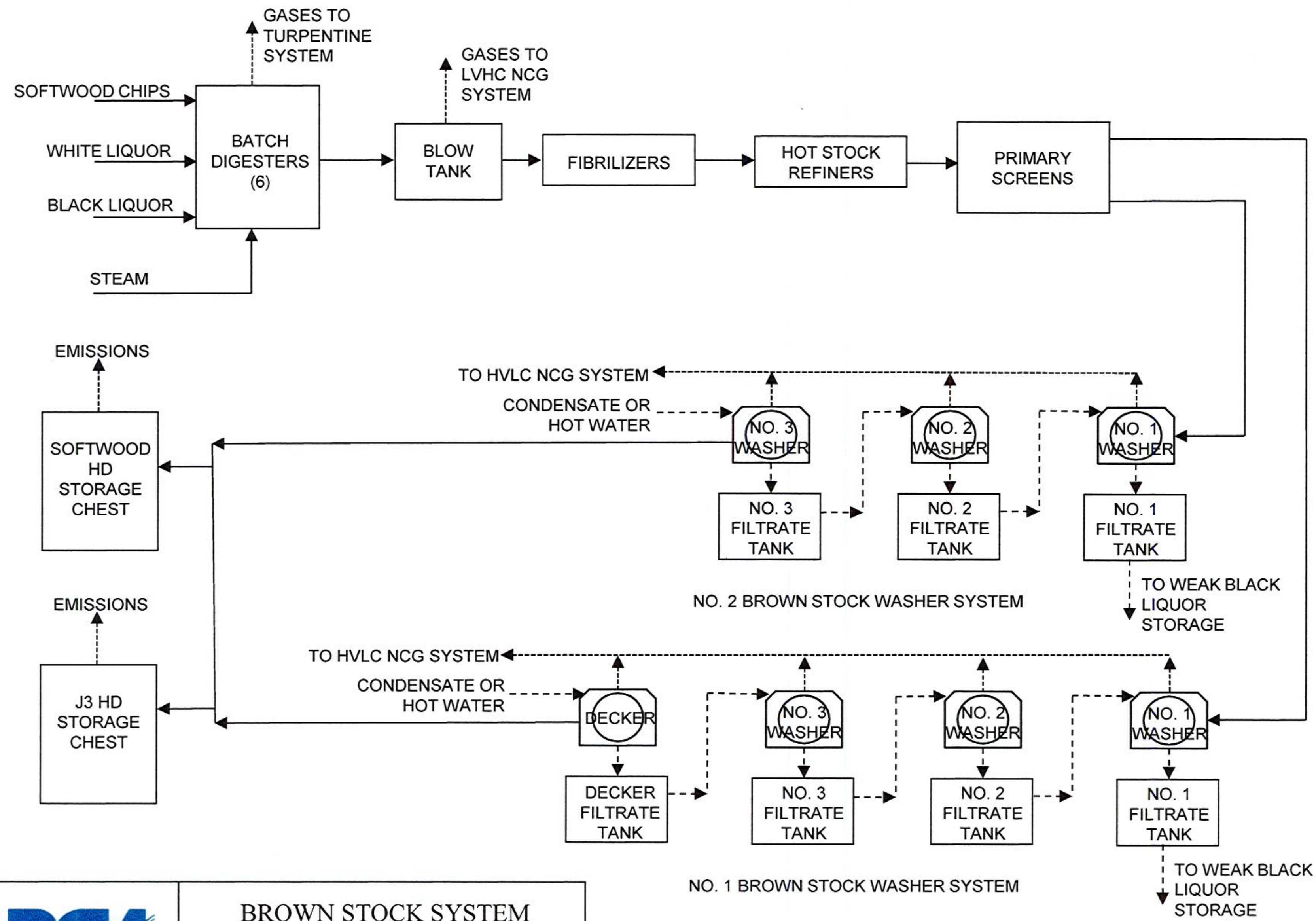
(1) Illustrate input of raw materials,

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

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

☒ (Check box if extra pages are attached)

See attached process flow diagram



BROWN STOCK SYSTEM PROCESS FLOW DIAGRAM

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

☒yes ☐no

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

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

☐yes ☒no

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

☐yes ☐no **Not Applicable**

List storage piles or other facility (if any):

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

Name of person preparing application: **Thomas Brett Horton, Senior Environmental Engineer**

Signature: Brett Horton Date: 12-28-20

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of firm or organization** Boise White Paper LLC, Jackson Mill

2. **Type of pollution control device: (If more than one, check each; however, separate forms are to be submitted for each specific device.)**

☐ Settling chamber ☐ Electrostatic precipitator
☐ Afterburner ☐ Baghouse
☐ Cyclone ☐ Multiclone
☐ Absorber ☐ Adsorber
☐ Condenser ☐ Wet Suppression

Wet scrubber (kind): ____________________

Stage 1 - Vapor balance (type): ____________________

Other (describe): Combination Boiler

3. **Control device manufacturer's information:**

Name of manufacturer Combustion Engineering, Inc. **Model No.** Contract No. 3363

4. **Emission source to which device is installed or is to be installed:**

High Volume Low Concentration Non-Condensable Gas System (gases collected from Pulp Washing Systems and Anaerobic Treatment System Tanks)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	TRS	HAPs	
Mass emission rate (#/hr)			
Uncontrolled	5.0	51	
Designed	0.050	0.51	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation	5 ppmv @ 10% O2	20 ppmv @ 10% O2	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	99%	99%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			88,840
(ACFM, existing conditions)			161,000
Temperature (°F)			158
Velocity (ft/sec)			53.4
Percent moisture			33

Pressure drop across device: 2 - 3 (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)................................ 414.648 (km)

UTM Coordinates (N-S)................................ 3484.269 (km)

Height above grade .... 200 (feet)

Inside diameter at exit (if opening is round)............. 8.0 (feet)

Inside area at exit (if opening is not round) .... N/A (sq. feet)

Base Elevation.. 45 (feet)

GEP Stack Height .... 213 (feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

See attached process flow diagram

9. Enclosed are:

☐Blueprints
☐Manufacturer's literature
☐Emissions test of existing installation
☐Other ______
☐Particle size distribution report
☐Size-efficiency curves
☐Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Closed-vent system bypass valve positions are continuously monitored.

12. By-pass (if any) is to be used when:

HVLC gases will normally be burned in the Combination Boiler (Recovery Furnace is backup).

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	N/A	N/A	N/A	N/A
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Not Applicable

Name of person preparing application Thomas Brett Horton, Senior Environmental Engineer

Signature [signature] Date 12-28-20

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of firm or organization** Boise White Paper LLC, Jackson Mill

2. **Type of pollution control device: (if more than one, check each; however, separate forms are to be submitted for each specific device.)**

   - ☐ Settling chamber
   - ☐ Electrostatic precipitator
   - ☐ Afterburner
   - ☐ Baghouse
   - ☐ Cyclone
   - ☐ Multiclone
   - ☐ Absorber
   - ☐ Adsorber
   - ☐ Condenser
   - ☐ Wet Suppression

   Wet scrubber (kind): ____________________

   Stage 1 - Vapor balance (type): ____________________

   Other (describe): Recovery Furnace

3. **Control device manufacturer's information:**

   Name of manufacturer Combustion Engineering, Inc. **Model No.** V2RX Direct Contact Evaporator

4. **Emission source to which device is installed or is to be installed:**

   High Volume Low Concentration Non-Condensable Gas System (gases collected from Pulp Washing Systems and Anaerobic Treatment System Tanks)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	TRS	HAPs	
Mass emission rate (#/hr)			
Uncontrolled	5.0	51	
Designed	0.050	0.51	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation	5 ppmv @ 10% O2	20 ppmv @ 10% O2	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	99%	99%	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			110,648
(ACFM, existing conditions)			271,451
Temperature (°F)			376
Velocity (ft/sec)			51.2
Percent moisture			35

Pressure drop across device: 1 - 3 (inches H_2O)

7. Stack dimensions:

UTM Coordinates (E-W)................................ 414.621 (km)

UTM Coordinates (N-S)................................ 3484.247 (km)

Height above grade .... 221 (feet)

Inside diameter at exit (if opening is round)............. 7.5 (feet)

Inside area at exit (if opening is not round) .... N/A (sq. feet)

Base Elevation... 45 (feet)

GEP Stack Height.. 213 (feet)

8. Provide a flow diagram which includes gas exit from process, each control device, location of by-pass, fan or blower, each emission point, exits for collected pollutants, and location of sampling ports.

See attached process flow diagram

9. Enclosed are:

- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other ____________________
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

10. If the pollution control device is of unusual design, please provide a sketch of the device.

11. List below the important operating parameters for the device. (For example: air/cloth ratio and fabric type, weight, and weave for baghouse; throat velocity and water use rate for a venturi scrubber; etc.)

Closed-vent system bypass valve positions are continuously monitored.

12. By-pass (if any) is to be used when:

HVLC gases will normally be burned in the Combination Boiler (Recovery Furnace is backup).

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	N/A	N/A	N/A	N/A
Composition				
Is waste hazardous?				
Method of disposal				
Final destination				

If collected air pollutants are recycled, describe:

Not Applicable

Name of person preparing application Thomas Brett Horton, Senior Environmental Engineer

Signature Brett Horton Date 12-28-20

APPENDIX B

Emissions Inventory

Project PSD Analysis Summary - Paper Machine Modifications and Addition of 1250 TPD Recycled Fiber Plant (Scenario A - 100% Recycle Pulp to No. 1 Machine)

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Lead (tpy)	TRS (tpy)	H_2S (tpy)
Projected Actual Emissions											
No. 1 Paper Machine	2.74	3.72	2.96	-	-	-	16.41	-	-	-	-
No. 3 Paper Machine	11.41	15.51	12.32	-	-	-	376.85	-	-	-	-
Deink Plant (Modified)	-	-	-	-	-	-	0.44	-	-	-	-
1250 TPD Recycled Fiber Plant	-	-	-	-	-	-	1.83	-	-	-	-
J3 High Density Pulp Storage Tank	-	-	-	-	-	-	27.81	-	-	2.33	0.049
New Brown Stock Washer Line	-	-	-	-	-	-	4.35	-	-	0.08	0.0036
PCA Drop Lot (Trailer Pool Parking)	5.14	1.31	0.13	-	-	-	-	-	-	-	-
TOTAL	**19.28**	**20.54**	**15.41**	-	-	-	**427.68**	-	-	**2.41**	**0.053**
Affected Source Emission Increases - Existing Emission Units											
Supplemental Steam from Package Boilers[1]	0.28	1.68	1.49	1.08	92.24	166.04	18.45	216,039	0.0009	-	-
Tall Oil Plant	-	-	-	-	-	-	27.07	-	-	0.36	0.17
Roads	6.67	1.33	0.33	-	-	-	-	-	-	-	-
TOTAL	**6.95**	**3.01**	**1.82**	**1.08**	-	-	**45.52**	**216,039**	**0.0009**	**0.36**	**0.17**
Baseline Actual Emissions											
No. 1 Paper Machine	2.21	3.12	2.95	-	-	-	8.86	-	-	-	-
No. 3 Paper Machine	7.45	10.50	9.93	-	-	-	29.84	-	-	-	-
Deink Plant	-	-	-	-	-	-	2.90	-	-	-	-
Bleach Plant E-1 Tower	-	-	-	-	-	5.33	3.73	-	-	-	-
Bleach Plant Filtrate Tank	-	-	-	-	-	-	3.27	-	-	-	-
Bleach Plant Scrubber	6.41	7.13	6.49	-	-	179.86	19.46	-	-	1.36	-
Chlorine Dioxide Plant	-	-	-	-	-	-	0.27	-	-	-	-
Methanol Tank	-	-	-	-	-	-	0.43	-	-	-	-
TOTAL	**16.07**	**20.76**	**19.37**	**0.00**	**0.00**	**185.19**	**68.77**	**0.00**	**0.0000**	**1.36**	**0.00**
Emission Increase [PAE - BAE + Affected Sources]	**10.16**	**2.80**	**-2.14**	**1.08**	**0.00**	**-185.19**	**404.43**	**216,039**	**0.0009**	**1.41**	**0.22**
PSD Significant Emission Rates	25	15	10	40	40	100	40	75,000	0.6	10	10
PSD Triggered?	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**

[1]Emissions of NOx and CO from Power Boilers 4 and 5 are excludable because they were federally permitted as part of PSD permits issued on 9/18/1995 and 5/10/1996, respectively.

Project PSD Analysis Summary - Paper Machine Modifications and Addition of 1250 TPD Recycled Fiber Plant (Scenario B - 100% Virgin Kraft Pulp to No. 1 Machine)

	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	NO_x (tpy)	CO (tpy)	VOC (tpy)	CO_2e (tpy)	Lead (tpy)	TRS (tpy)	H_2S (tpy)
Projected Actual Emissions											
No. 1 Paper Machine	2.74	3.72	2.96	-	-	-	142.57	-	-	-	-
No. 3 Paper Machine	11.41	15.51	12.32	-	-	-	250.68	-	-	-	-
Deink Plant (Modified)	-	-	-	-	-	-	0.44	-	-	-	-
1250 TPD Recycled Fiber Plant	-	-	-	-	-	-	1.83	-	-	-	-
J3 High Density Pulp Storage Tank	-	-	-	-	-	-	27.81	-	-	2.33	0.049
New Brown Stock Washer Line	-	-	-	-	-	-	4.35	-	-	0.08	0.0036
PCA Drop Lot (Trailer Pool Parking)	5.14	1.31	0.13	-	-	-	-	-	-	-	-
TOTAL	**19.28**	**20.54**	**15.41**	-	-	-	**427.68**	-	-	**2.41**	**0.053**
Affected Source Emission Increases - Existing Emission Units											
Supplemental Steam from Package Boilers[1]	0.28	1.68	1.49	1.08	92.24	166.04	18.45	216,039	0.0009	-	-
Tall Oil Plant	-	-	-	-	-	-	27.07	-	-	0.36	0.17
Roads	6.67	1.33	0.33	-	-	-	-	-	-	-	-
TOTAL	**6.95**	**3.01**	**1.82**	**1.08**	-	-	**45.52**	**216,039**	**0.0009**	**0.36**	**0.17**
Baseline Actual Emissions											
No. 1 Paper Machine	2.21	3.12	2.95	-	-	-	8.86	-	-	-	-
No. 3 Paper Machine	7.45	10.50	9.93	-	-	-	29.84	-	-	-	-
Deink Plant	-	-	-	-	-	-	2.90	-	-	-	-
Bleach Plant E-1 Tower	-	-	-	-	-	5.33	3.73	-	-	-	-
Bleach Plant Filtrate Tank	-	-	-	-	-	-	3.27	-	-	-	-
Bleach Plant Scrubber	6.41	7.13	6.49	-	-	179.86	19.46	-	-	1.36	-
Chlorine Dioxide Plant	-	-	-	-	-	-	0.27	-	-	-	-
Methanol Tank	-	-	-	-	-	-	0.43	-	-	-	-
TOTAL	**16.07**	**20.76**	**19.37**	**0.00**	**0.00**	**185.19**	**68.77**	**0.00**	**0.0000**	**1.36**	**0.00**
Emission Increase [PAE - BAE + Affected Sources]	**10.16**	**2.80**	**-2.14**	**1.08**	**0.00**	**-185.19**	**404.43**	**216,039**	**0.0009**	**1.41**	**0.22**
PSD Significant Emission Rates	25	15	10	40	40	100	40	75,000	0.6	10	10
PSD Triggered?	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**Yes**	**No**	**No**	**No**

[1]Emissions of NOx and CO from Power Boilers 4 and 5 are excludable because they were federally permitted as part of PSD permits issued on 9/18/1995 and 5/10/1996, respectively.

Boise White Paper, LLC
Air Toxic Emissions Summary
Scenario A - 100% Recycle Pulp to No. 1 Paper Machine

		Projected Air Toxic Emissions									Baseline Air Toxic Emissions									
Compound	CAS Number	PM1 tpy	PM3 tpy	Deink tpy	New OCC tpy	J3 HDS tpy	New BSW tpy	Boilers tpy	CTO tpy	Projected Total (tpy)	PM1 tpy	PM3 tpy	Deink tpy	E-1 Tower tpy	E-1 Filtrate tpy	BP Scrubber tpy	ClO2 tpy	Methanol tpy	Baseline Total (tpy)	Increase tpy
1,1,1-Trichloroethane	71-55-6		0.50				0.0000068		0.00067	0.50									0.00	0.50
1,1,2-Trichloroethane	79-00-5		0.58			0.00027	0.000059		0.0079	0.59						0.00091			0.00091	0.59
1,2,4-Trichlorobenzene	120-82-1		1.90				0.00011		0.00016	1.90	0.034	0.12				0.021			0.17	1.72
1,2-Dichloroethylene	540-59-0		2.49			0.00032	0.000010		0.00085	2.49	0.048	0.16				0.00047			0.21	2.28
1,2-Dimethoxyethane	110-71-4	0.14	0.25	0.0022	0.0090					0.40			0.0010						0.0010	0.40
1,3-Butadiene	106-99-0						0.000014			0.000014									0.00	0.000014
1,4-Dichlorobenzene	106-46-7							0.0022		0.0022									0.00	0.0022
Acetaldehyde	75-07-0	1.50	4.53	0.064	0.26	0.023	0.018		0.015	6.42	0.24	0.82	0.13			0.22	0.017		1.43	4.99
Acetone	67-64-1		12.04			0.037	0.060		0.16	12.29	0.72	2.42		0.067	0.080	0.49			3.78	8.51
Acetophenone	98-86-2						0.027			0.027									0.00	0.027
Acrolein	107-02-8		1.06				0.00041		0.0099	1.07	0.14	0.48				0.0039			0.63	0.45
Alpha-Pinene	80-56-8	0.061	0.10			17.65	0.083		15.81	33.71	1.70	5.73	0.022		0.00092	0.097	0.033		7.58	26.13
Benzaldehyde	100-52-7						0.0014			0.0014									0.00	0.0014
Benzene	71-43-2		0.24			0.000077	0.000074	0.0038	0.00076	0.24	0.015	0.051				0.0054	0.00050		0.073	0.17
Biphenyl	92-52-4	1.97	3.39	0.021	0.086		0.00016			5.46			0.061						0.061	5.40
Carbon Disulfide	75-15-0	0.29	0.50	0.087	0.36		0.00032		0.013	1.26			0.00027						0.00027	1.25
Carbon Tetrachloride	56-23-5						0.000018			0.000018									0.00	0.000018
Chlorobenzene	108-90-7		0.21			0.000088	0.000035		0.00091	0.21	0.015	0.049			0.0010	0.0011	0.00031		0.066	0.15
Chloroform	67-66-3	0.27	0.47	0.0027	0.011	0.020	0.00053		0.00125	0.78	0.0083	0.028	0.46	0.12		0.67	0.034		1.32	-0.54
Chloromethane	74-87-3						0.000082		0.19	0.19									0.00	0.19
Cresol (mixed isomers)	1319-77-3						0.032			0.032									0.00	0.03
Crotonaldehyde	123-73-9					0.0012	0.00039			0.0016									0.00	0.00162
Cumene	98-82-8	0.25	0.43						0.35	1.03			0.000063			0.029			0.029	1.01
Cyclohexanone	108-94-1						0.00078			0.00078									0.00	0.00078
Dimethyl Disulfide	624-92-0					0.90	0.10			1.00									0.00	1.00
Dimethyl Sulfide	75-18-3		3.87			2.19	0.16		0.029	6.26						0.17			0.17	6.09
Ethanol	64-17-5		20.89			0.13	0.017		0.0011	21.03						0.34			0.34	20.69
Ethyl Benzene	100-41-4						0.0000040			0.0000040									0.00	3.99E-06
Formaldehyde	50-00-0	0.086	0.57	0.0076	0.031		0.0024	0.13		0.83	0.14	0.46	0.0012			0.068	0.0053		0.68	0.15
Hydrogen Sulfide	7783-06-4					0.049	0.0036		0.17	0.22									0.00	0.22
Isopropanol	67-63-0						0.0017			0.0017									0.00	0.0017
Limonene	138-86-3						0.078			0.078									0.00	0.078
Methanol	67-56-1	9.65	67.52	0.14	0.58	1.05	0.88		0.57	80.38	2.34	7.88	0.14	3.60	3.20	16.00	0.067	0.43	33.66	46.72
Methylene Chloride	75-09-2	0.35	1.90	0.0092	0.038		0.00030			2.30	0.048	0.16	0.0039			0.013	0.0022		0.23	2.07
Methyl Ethyl Ketone	78-93-3	0.0039	2.62			0.027	0.010		0.0107	2.67	0.11	0.36	0.017	0.0091	0.0063	0.091			0.59	2.08
Methyl Isobutyl Ketone	108-10-1		0.63			0.0027	0.0012		0.0016	0.64	0.053	0.18				0.033			0.27	0.37
Methyl Mercaptan	74-93-1		3.04			0.015	0.023		0.047	3.13	0.59	2.00				0.13			2.72	0.41
Naphthalene	91-20-3	0.34	0.59				0.000021	0.0011		0.93	0.037	0.12	0.0053						0.17	0.77
n-Hexane	110-54-3		0.108			0.00074	0.00016	3.24	0.057	3.40	0.015	0.051				0.0031			0.070	3.33
Phenol	108-95-2	0.63	1.09	0.017	0.070	0.23	0.0022		0.116	2.16	0.69	2.32	0.10			0.45	0.015		3.58	-1.42
Propionaldehyde	123-38-6	0.050	0.32	0.0078	0.033	0.010	0.0014		0.0030	0.43	0.45	1.50	0.019			0.069			2.03	-1.61
Styrene	100-42-5		0.57			0.0012	0.00026		0.0067	0.58	0.016	0.054	0.0019	0.0069	0.010	0.011	0.00072		0.10	0.48
Tetrachloroethylene	127-18-4		1.69			0.00028	0.00020		0.0079	1.70	0.13	0.45							0.59	1.11
Toluene	108-88-3	0.29	0.84	0.088	0.37	0.00089	0.00062	0.0061	0.0097	1.61	0.011	0.037	0.31	0.0012		0.013			0.37	1.24
Trichloroethylene	79-01-6		1.06			0.00027	0.000081		0.00087	1.06	0.000018	0.000060				0.0016			0.0017	1.06
Vinyl chloride	75-01-4						0.00074			0.00074										0.00074
Xylenes (mixed isomers)	1330-20-7					0.0010	0.00033		0.0072	0.0086	0.0033	0.011		0.0019	0.0025	0.0030	0.00061		0.022	-0.014

Notes:

Bold text denotes air toxic compounds for which emissions will increase by 0.1 lb/hr or more' as a result of this project.

Boise White Paper, LLC
Air Toxic Emissions Summary
Scenario B - 100% Virgin Kraft Pulp to No. 1 Paper Machine

Compound	CAS	Projected Air Toxic Emissions									Baseline Air Toxic Emissions									
		PM1	PM3	Deink	New OCC	J3 HDS	New BSW	Boilers	CTO	Projected	PM1	PM3	Deink	E-1 Tower	E-1 Filtrate	BP Scrubber	ClO2	Methanol	Baseline	Increase
	Number	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	Total (tpy)	tpy	tpy	tpy	tpy	tpy	tpy	tpy	tpy	Total (tpy)	tpy
1,1,1-Trichloroethane	71-55-6	0.20	0.29				0.0000068		0.00067	0.50									0.00	0.50
1,1,2-Trichloroethane	79-00-5	0.24	0.34			0.00027	0.000059		0.0079	0.59						0.00091			0.00091	0.59
1,2,4-Trichlorobenzene	120-82-1	0.78	1.12				0.00011		0.00016	1.90	0.034	0.12				0.021			0.17	1.72
1,2-Dichloroethylene	540-59-0	1.02	1.47			0.00032	0.000010		0.00085	2.49	0.048	0.16				0.00047			0.21	2.28
1,2-Dimethoxyethane	110-71-4		0.39	0.0022	0.0090					0.40			0.0010						0.0010	0.40
1,3-Butadiene	106-99-0						0.000014			0.000014									0.00	0.000014
1,4-Dichlorobenzene	106-46-7							0.0022		0.0022									0.00	0.0022
Acetaldehyde	75-07-0	0.79	5.24	0.064	0.26	0.023	0.018		0.015	6.42	0.24	0.82	0.13			0.22	0.017		1.43	4.99
Acetone	67-64-1	4.92	7.11			0.037	0.060		0.16	12.29	0.72	2.42		0.067	0.080	0.49			3.78	8.51
Acetophenone	98-86-2						0.027			0.027									0.00	0.027
Acrolein	107-02-8	0.43	0.63				0.00041		0.0099	1.07	0.14	0.48				0.0039			0.63	0.45
Alpha-Pinene	80-56-8		0.17			17.65	0.083		15.81	33.71	1.70	5.73	0.022		0.00092	0.097	0.033		7.58	26.13
Benzaldehyde	100-52-7						0.0014			0.0014									0.00	0.0014
Benzene	71-43-2	0.096	0.14			0.000077	0.000074	0.0038	0.00076	0.24	0.015	0.051				0.0054	0.00050		0.073	0.17
Biphenyl	92-52-4		5.36	0.021	0.086		0.00016			5.46			0.061						0.061	5.40
Carbon Disulfide	75-15-0		0.79	0.087	0.36		0.00032		0.013	1.26			0.00027						0.00027	1.25
Carbon Tetrachloride	56-23-5						0.000018			0.000018									0.00	0.000018
Chlorobenzene	108-90-7	0.086	0.12			0.000088	0.000035		0.00091	0.21	0.015	0.049			0.0010	0.0011	0.00031		0.066	0.15
Chloroform	67-66-3		0.74	0.0027	0.011	0.020	0.00053		0.00125	0.78	0.0083	0.028	0.46	0.12		0.67	0.034		1.32	-0.54
Chloromethane	74-87-3						0.000082		0.19	0.19									0.00	0.19
Cresol (mixed isomers)	1319-77-3						0.032			0.032									0.00	0.03
Crotonaldehyde	123-73-9					0.0012	0.00039			0.0016									0.00	0.00162
Cumene	98-82-8		0.68						0.35	1.03			0.000063			0.029			0.029	1.01
Cyclohexanone	108-94-1						0.00078			0.00078									0.00	0.00078
Dimethyl Disulfide	624-92-0					0.90	0.10			1.00									0.00	1.00
Dimethyl Sulfide	75-18-3	1.58	2.29			2.19	0.16		0.029	6.26						0.17			0.17	6.09
Ethanol	64-17-5	8.54	12.35			0.13	0.017		0.0011	21.03						0.34			0.34	20.69
Ethyl Benzene	100-41-4						0.0000040			0.0000040									0.00	3.99E-06
Formaldehyde	50-00-0	0.17	0.48	0.0076	0.031		0.0024	0.13		0.83	0.14	0.46	0.0012			0.068	0.0053		0.68	0.15
Hydrogen Sulfide	7783-06-4					0.049	0.0036		0.17	0.22									0.00	0.22
Isopropanol	67-63-0						0.0017			0.0017									0.00	0.0017
Limonene	138-86-3						0.078			0.078									0.00	0.078
Methanol	67-56-1	20.82	56.35	0.14	0.58	1.05	0.88		0.57	80.38	2.34	7.88	0.14	3.60	3.20	16.00	0.067	0.43	33.66	46.72
Methylene Chloride	75-09-2	0.53	1.72	0.0092	0.038		0.00030			2.30	0.048	0.16	0.0039			0.013	0.0022		0.23	2.07
Methyl Ethyl Ketone	78-93-3	1.07	1.56			0.027	0.010		0.0107	2.67	0.11	0.36	0.017	0.0091	0.0063	0.091			0.59	2.08
Methyl Isobutyl Ketone	108-10-1	0.26	0.37			0.0027	0.0012		0.0016	0.64	0.053	0.18				0.033			0.27	0.37
Methyl Mercaptan	74-93-1	1.24	1.80			0.015	0.023		0.047	3.13	0.59	2.00				0.13			2.72	0.41
Naphthalene	91-20-3		0.93				0.000021	0.0011		0.93	0.037	0.12	0.0053						0.17	0.77
n-Hexane	110-54-3	0.044	0.064			0.00074	0.00016	3.24	0.057	3.40	0.015	0.051				0.0031			0.070	3.33
Phenol	108-95-2		1.73	0.017	0.070	0.23	0.0022		0.116	2.16	0.69	2.32	0.10			0.45	0.015		3.58	-1.42
Propionaldehyde	123-38-6	0.097	0.27	0.0078	0.033	0.010	0.0014		0.0030	0.43	0.45	1.50	0.019			0.069			2.03	-1.61
Styrene	100-42-5	0.23	0.34			0.0012	0.00026		0.0067	0.58	0.016	0.054	0.0019	0.0069	0.010	0.011	0.00072		0.10	0.48
Tetrachloroethylene	127-18-4	0.69	1.00			0.00028	0.00020		0.0079	1.70	0.13	0.45							0.59	1.11
Toluene	108-88-3	0.14	1.00	0.088	0.37	0.00089	0.00062	0.0061	0.0097	1.61	0.011	0.037	0.31	0.0012		0.013			0.37	1.24
Trichloroethylene	79-01-6	0.43	0.63			0.00027	0.000081		0.00087	1.06	0.000018	0.000060				0.0016			0.0017	1.06
Vinyl chloride	75-01-4						0.00074			0.00074										0.00074
Xylenes (mixed isomers)	1330-20-7					0.0010	0.00033		0.0072	0.0086	0.0033	0.011		0.0019	0.0025	0.0030	0.00061		0.022	-0.014

Notes:

Bold text denotes air toxic compounds for which emissions will increase by 0.1 lb/hr or more' as a result of this project.

Boise White Paper, LLC

Projected Actual Emission Estimates (Scenario A)

No. 1 Paper Machine — Source No. 102-0001-X026

Paper Produced = 219,000 Machine-Dried Tons

Annual Production = 226,300 Air-Dried Finished Tons (See Note 3)

Compound	Emission Factor		Emission Rate tpy	Notes
Filterable PM	0.025	lb/MDT	2.74	1
Total PM-10	0.034	lb/MDT	3.72	1
Total PM-2.5	0.027	lb/MDT	2.96	1
VOC	0.145	lb/ADTFP	16.4	2
1,2-Dimethoxyethane	0.00127	lb/ADTFP	0.14	2
Acetaldehyde	0.0133	lb/ADTFP	1.50	2
Alpha-Pinene	0.000538	lb/ADTFP	0.061	2
Biphenyl	0.0174	lb/ADTFP	1.97	2
Carbon Disulfide	0.00258	lb/ADTFP	0.29	2
Chloroform	0.00241	lb/ADTFP	0.27	2
Cumene	0.00221	lb/ADTFP	0.25	2
Formaldehyde	0.000762	lb/ADTFP	0.086	2
Methanol	0.0853	lb/ADTFP	9.65	2
Methylene Chloride	0.00309	lb/ADTFP	0.35	2
Methyl Ethyl Ketone	3.49E-05	lb/ADTFP	0.0039	2
Naphthalene	0.00302	lb/ADTFP	0.34	2
Phenol	0.00561	lb/ADTFP	0.63	2
Propionaldehyde	0.000438	lb/ADTFP	0.050	2
Toluene	0.00259	lb/ADTFP	0.29	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column D. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from "Master Summary Table of NCASI Emission Factors for Pulp and Paper Mills - Air Toxics" Version 1.11: December 2018; Unit Operation: Paper Machines; 100% Recovered Fiber.
VOC is the sum of volatile organic compounds detected.
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Recycled Fraction / (2,000 lb/ton)

3 Machine-dry paper contains 7% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.93 / 0.90

Boise White Paper, LLC

Projected Actual Emission Estimates (Scenario B)
No. 1 Paper Machine Source No. 102-0001-X026

Paper Produced = 219,000 Machine-Dried Tons
Annual Production = 226,300 Air-Dried Finished Tons (See Note 3)

Compound	Emission Factor Virgin Kraft		Emission Rate tpy	Notes
Filterable PM	0.025	lb/MDT	2.74	1
Total PM-10	0.034	lb/MDT	3.72	1
Total PM-2.5	0.027	lb/MDT	2.96	1
VOC	1.26	lb/ADTFP	142.6	2
1,1,1-Trichloroethane	0.0018	lb/ADTFP	0.20	2
1,1,2-Trichloroethane	0.0021	lb/ADTFP	0.24	2
1,2,4-Trichlorobenzene	0.00685	lb/ADTFP	0.78	2
1,2-Dichloroethylene	0.009	lb/ADTFP	1.02	2
Acetaldehyde	0.00702	lb/ADTFP	0.79	2
Acetone	0.0435	lb/ADTFP	4.92	2
Acrolein	0.00384	lb/ADTFP	0.43	2
Benzene	0.00085	lb/ADTFP	0.10	2
Chlorobenzene	0.00076	lb/ADTFP	0.086	2
Dimethyl Sulfide	0.014	lb/ADTFP	1.58	2
Ethanol	0.0755	lb/ADTFP	8.54	2
Formaldehyde	0.00151	lb/ADTFP	0.17	2
Methanol	0.184	lb/ADTFP	20.82	2
Methylene Chloride	0.0047	lb/ADTFP	0.53	2
Methyl Ethyl Ketone	0.00945	lb/ADTFP	1.07	2
Methyl Isobutyl Ketone	0.00229	lb/ADTFP	0.26	2
Methyl Mercaptan	0.011	lb/ADTFP	1.24	2
n-Hexane	0.00039	lb/ADTFP	0.044	2
Propionaldehyde	0.000855	lb/ADTFP	0.10	2
Styrene	0.00205	lb/ADTFP	0.23	2
Tetrachloroethylene	0.0061	lb/ADTFP	0.69	2
Toluene	0.00123	lb/ADTFP	0.14	2
Trichloroethylene	0.00383	lb/ADTFP	0.43	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column D. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.83, 4.84 and 4.85: Summary of Air Toxic Emissions from Unbleached Kraft Paper Machines, pp. 144-145. VOC is the sum of volatile organic compounds detected in the study.
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Virgin Fraction / (2,000 lb/ton)

3 Machine-dry paper contains 7% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.93 / 0.90

Boise White Paper, LLC
Projected Actual Emission Estimates (Scenario A)
No. 3 Paper Machine — Source No. 102-0001-X027

Paper Produced = 912,500 Machine-Dried Tons
Annual Production = 942,917 Air-Dried Finished Tons (See Note 4)
Virgin Kraft Fraction = 0.59
Recycled Pulp Fraction = 0.41

Compound	Emission Factor				Emission Rate	Notes
	Virgin Kraft		Recycled Pulp		tpy	
Filterable PM	0.025	lb/MDT	0.025	lb/MDT	11.4	1
Total PM-10	0.034	lb/MDT	0.034	lb/MDT	15.5	1
Total PM-2.5	0.027	lb/MDT	0.027	lb/MDT	12.3	1
VOC	1.26	lb/ADTFP	0.145	lb/ADTFP	376.8	2
1,1,1-Trichloroethane	0.0018	lb/ADTFP			0.50	2
1,1,2-Trichloroethane	0.0021	lb/ADTFP			0.58	2
1,2,4-Trichlorobenzene	0.00685	lb/ADTFP			1.90	2
1,2-Dichloroethylene	0.009	lb/ADTFP			2.49	2
1,2-Dimethoxyethane			0.00127	lb/ADTFP	0.25	3
Acetaldehyde	0.00702	lb/ADTFP	0.0133	lb/ADTFP	4.53	2, 3
Acetone	0.0435	lb/ADTFP			12.04	2
Acrolein	0.00384	lb/ADTFP			1.06	2
Alpha-Pinene			0.000538	lb/ADTFP	0.10	3
Benzene	0.00085	lb/ADTFP			0.24	2
Biphenyl			0.0174	lb/ADTFP	3.39	3
Carbon Disulfide			0.00258	lb/ADTFP	0.50	3
Chlorobenzene	0.00076	lb/ADTFP			0.21	2
Chloroform			0.00241	lb/ADTFP	0.47	3
Cumene			0.00221	lb/ADTFP	0.43	3
Dimethyl Sulfide	0.014	lb/ADTFP			3.87	2
Ethanol	0.0755	lb/ADTFP			20.89	2
Formaldehyde	0.00151	lb/ADTFP	0.000762	lb/ADTFP	0.57	2, 3
Methanol	0.184	lb/ADTFP	0.0853	lb/ADTFP	67.5	2, 3
Methylene Chloride	0.0047	lb/ADTFP	0.00309	lb/ADTFP	1.90	2, 3
Methyl Ethyl Ketone	0.00945	lb/ADTFP	0.0000349	lb/ADTFP	2.62	2, 3
Methyl Isobutyl Ketone	0.00229	lb/ADTFP			0.63	2
Methyl Mercaptan	0.011	lb/ADTFP			3.04	2
Naphthalene			0.00302	lb/ADTFP	0.59	3
n-Hexane	0.00039	lb/ADTFP			0.11	2
Phenol			0.00561	lb/ADTFP	1.09	3
Propionaldehyde	0.000855	lb/ADTFP	0.000438	lb/ADTFP	0.32	2, 3
Styrene	0.00205	lb/ADTFP			0.57	2
Tetrachloroethylene	0.0061	lb/ADTFP			1.69	2
Toluene	0.00123	lb/ADTFP	0.00259	lb/ADTFP	0.84	2, 3
Trichloroethylene	0.00383	lb/ADTFP			1.06	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column D. The calculation is: Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.83, 4.84 and 4.85: Summary of Air Toxic Emissions from Unbleached Kraft Paper Machines, pp. 144-145. VOC is the sum of volatile organic compounds detected in the study. Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Virgin Fraction / (2,000 lb/ton)

3 Emission factors were obtained from "Master Summary Table of NCASI Emission Factors for Pulp and Paper Mills - Air Toxics" Version 1.11: December 2018; Unit Operation: Paper Machines; 100% Recovered Fiber. VOC is the sum of volatile organic compounds detected.
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Recycled Fraction / (2,000 lb/ton)

4 Machine-dry paper contains 7% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.93 / 0.90

Boise White Paper, LLC
Projected Actual Emission Estimates (Scenario B)
No. 3 Paper Machine Source No. 102-0001-X027

Paper Produced = 912,500 Machine-Dried Tons
Annual Production = 942,917 Air-Dried Finished Tons (See Note 4)
Virgin Kraft Fraction = 0.35
Recycled Pulp Fraction = 0.65

Compound	Emission Factor				Emission Rate	Notes
	Virgin Kraft		Recycled Pulp		tpy	
Filterable PM	0.025	lb/MDT	0.025	lb/MDT	11.4	1
Total PM-10	0.034	lb/MDT	0.034	lb/MDT	15.5	1
Total PM-2.5	0.027	lb/MDT	0.027	lb/MDT	12.3	1
VOC	1.26	lb/ADTFP	0.145	lb/ADTFP	250.7	2
1,1,1-Trichloroethane	0.0018	lb/ADTFP			0.29	2
1,1,2-Trichloroethane	0.0021	lb/ADTFP			0.34	2
1,2,4-Trichlorobenzene	0.00685	lb/ADTFP			1.12	2
1,2-Dichloroethylene	0.009	lb/ADTFP			1.47	2
1,2-Dimethoxyethane			0.00127	lb/ADTFP	0.39	3
Acetaldehyde	0.00702	lb/ADTFP	0.0133	lb/ADTFP	5.24	2, 3
Acetone	0.0435	lb/ADTFP			7.11	2
Acrolein	0.00384	lb/ADTFP			0.63	2
Alpha-Pinene			0.000538	lb/ADTFP	0.17	3
Benzene	0.00085	lb/ADTFP			0.14	2
Biphenyl			0.0174	lb/ADTFP	5.36	3
Carbon Disulfide			0.00258	lb/ADTFP	0.79	3
Chlorobenzene	0.00076	lb/ADTFP			0.12	2
Chloroform			0.00241	lb/ADTFP	0.74	3
Cumene			0.00221	lb/ADTFP	0.68	3
Dimethyl Sulfide	0.014	lb/ADTFP			2.29	2
Ethanol	0.0755	lb/ADTFP			12.35	2
Formaldehyde	0.00151	lb/ADTFP	0.000762	lb/ADTFP	0.48	2, 3
Methanol	0.184	lb/ADTFP	0.0853	lb/ADTFP	56.4	2, 3
Methylene Chloride	0.0047	lb/ADTFP	0.00309	lb/ADTFP	1.72	2, 3
Methyl Ethyl Ketone	0.00945	lb/ADTFP	0.0000349	lb/ADTFP	1.56	2, 3
Methyl Isobutyl Ketone	0.00229	lb/ADTFP			0.37	2
Methyl Mercaptan	0.011	lb/ADTFP			1.80	2
Naphthalene			0.00302	lb/ADTFP	0.93	3
n-Hexane	0.00039	lb/ADTFP			0.064	2
Phenol			0.00561	lb/ADTFP	1.73	3
Propionaldehyde	0.000855	lb/ADTFP	0.000438	lb/ADTFP	0.27	2, 3
Styrene	0.00205	lb/ADTFP			0.34	2
Tetrachloroethylene	0.0061	lb/ADTFP			1.00	2
Toluene	0.00123	lb/ADTFP	0.00259	lb/ADTFP	1.00	2, 3
Trichloroethylene	0.00383	lb/ADTFP			0.63	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column D. The calculation is: Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.83, 4.84 and 4.85: Summary of Air Toxic Emissions from Unbleached Kraft Paper Machines, pp. 144-145. VOC is the sum of volatile organic compounds detected in the study. Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Virgin Fraction / (2,000 lb/ton)

3 Emission factors were obtained from "Master Summary Table of NCASI Emission Factors for Pulp and Paper Mills - Air Toxics" Version 1.11: December 2018; Unit Operation: Paper Machines; 100% Recovered Fiber. VOC is the sum of volatile organic compounds detected. Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Recycled Fraction / (2,000 lb/ton)

4 Machine-dry paper contains 7% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.93 / 0.90

Boise White Paper, LLC
Projected Actual Emission Estimates
Combined Emissions - No. 1 and No. 3 Paper Machines

Paper Produced =	1,131,500	Machine-Dried Tons
Annual Production =	1,169,217	Air-Dried Finished Tons (See Note 4)
Virgin Kraft Fraction =	0.47	
Recycled Pulp Fraction =	0.53	

Compound	Emission Factor				Emission Rate	Notes
	Virgin Kraft		Recycled Pulp		tpy	
Filterable PM	0.025	lb/MDT	0.025	lb/MDT	14.1	1
Total PM-10	0.034	lb/MDT	0.034	lb/MDT	19.2	1
Total PM-2.5	0.027	lb/MDT	0.027	lb/MDT	15.3	1
VOC	1.26	lb/ADTFP	0.145	lb/ADTFP	393.3	2
1,1,1-Trichloroethane	0.0018	lb/ADTFP			0.50	2
1,1,2-Trichloroethane	0.0021	lb/ADTFP			0.58	2
1,2,4-Trichlorobenzene	0.00685	lb/ADTFP			1.90	2
1,2-Dichloroethylene	0.009	lb/ADTFP			2.49	2
1,2-Dimethoxyethane			0.00127	lb/ADTFP	0.39	3
Acetaldehyde	0.00702	lb/ADTFP	0.0133	lb/ADTFP	6.04	2, 3
Acetone	0.0435	lb/ADTFP			12.04	2
Acrolein	0.00384	lb/ADTFP			1.06	2
Alpha-Pinene			0.000538	lb/ADTFP	0.17	3
Benzene	0.00085	lb/ADTFP			0.24	2
Biphenyl			0.0174	lb/ADTFP	5.36	3
Carbon Disulfide			0.00258	lb/ADTFP	0.79	3
Chlorobenzene	0.00076	lb/ADTFP			0.21	2
Chloroform			0.00241	lb/ADTFP	0.74	3
Cumene			0.00221	lb/ADTFP	0.68	3
Dimethyl Sulfide	0.014	lb/ADTFP			3.87	2
Ethanol	0.0755	lb/ADTFP			20.89	2
Formaldehyde	0.00151	lb/ADTFP	0.000762	lb/ADTFP	0.65	2, 3
Methanol	0.184	lb/ADTFP	0.0853	lb/ADTFP	77.2	2, 3
Methylene Chloride	0.0047	lb/ADTFP	0.00309	lb/ADTFP	2.25	2, 3
Methyl Ethyl Ketone	0.00945	lb/ADTFP	0.0000349	lb/ADTFP	2.63	2, 3
Methyl Isobutyl Ketone	0.00229	lb/ADTFP			0.63	2
Methyl Mercaptan	0.011	lb/ADTFP			3.04	2
Naphthalene			0.00302	lb/ADTFP	0.93	3
n-Hexane	0.00039	lb/ADTFP			0.108	2
Phenol			0.00561	lb/ADTFP	1.73	3
Propionaldehyde	0.000855	lb/ADTFP	0.000438	lb/ADTFP	0.37	2, 3
Styrene	0.00205	lb/ADTFP			0.57	2
Tetrachloroethylene	0.0061	lb/ADTFP			1.69	2
Toluene	0.00123	lb/ADTFP	0.00259	lb/ADTFP	1.14	2, 3
Trichloroethylene	0.00383	lb/ADTFP			1.06	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column D. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.83, 4.84 and 4.85: Summary of Air Toxic Emissions from Unbleached Kraft Paper Machines, pp. 144-145. VOC is the sum of volatile organic compounds detected in the study.
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Virgin Fraction / (2,000 lb/ton)

3 Emission factors were obtained from "Master Summary Table of NCASI Emission Factors for Pulp and Paper Mills - Air Toxics" Version 1.11: December 2018; Unit Operation: Paper Machines; 100% Recovered Fiber.
VOC is the sum of volatile organic compounds detected.
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Production (ADTFP) * Recycled Fraction / (2,000 lb/ton)

4 Machine-dry paper contains 7% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.93 / 0.90

Boise White Paper, LLC
Projected Actual Emission Estimates
Recycle Plant — Source No. 102-0001-X028

Recycle Pulp Produced = 109,500 ADTP/yr

Pollutant	Emission Factor (units)	Emission Rate tpy	Notes
VOC	0.0080 lb/ADTP	0.44	1
1,2-Dimethoxyethane	3.93E-05 lb/ADTP	0.0022	1
Acetaldehyde	0.00116 lb/ADTP	0.064	1
Biphenyl	0.000377 lb/ADTP	0.021	1
Carbon Disulfide	0.00158 lb/ADTP	0.087	1
Chloroform	4.98E-05 lb/ADTP	0.0027	1
Formaldehyde	0.000138 lb/ADTP	0.0076	1
Methanol	0.00253 lb/ADTP	0.14	1
Methylene Chloride	0.000168 lb/ADTP	0.0092	1
Phenol	0.000307 lb/ADTP	0.017	1
Propionaldehyde	0.000143 lb/ADTP	0.0078	1
Toluene	0.0016 lb/ADTP	0.088	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 9.5, Air Toxic Emissions from OCC and Recycled Paperboard Stock Preparation, p. 225. VOC is the sum of all compounds. The calculation is: Emission rate (tpy) = Emission Factor (lb/ADTP) * Recycle Pulp Produced (ADTP/yr) / (2,000 lb/ton)

Boise White Paper, LLC
Potential Emission Estimates
New Recycled Fiber Plant

Recycle Pulp Produced = 456,250 ADTP/yr

Pollutant	Emission Factor (units)	Emission Rate tpy	Notes
VOC	0.0080 lb/ADTP	1.83	1
1,2-Dimethoxyethane	3.93E-05 lb/ADTP	0.0090	1
Acetaldehyde	0.00116 lb/ADTP	0.26	1
Biphenyl	0.000377 lb/ADTP	0.086	1
Carbon Disulfide	0.00158 lb/ADTP	0.36	1
Chloroform	4.98E-05 lb/ADTP	0.011	1
Formaldehyde	0.000138 lb/ADTP	0.031	1
Methanol	0.00253 lb/ADTP	0.58	1
Methylene Chloride	0.000168 lb/ADTP	0.038	1
Phenol	0.000307 lb/ADTP	0.070	1
Propionaldehyde	0.000143 lb/ADTP	0.033	1
Toluene	0.0016 lb/ADTP	0.37	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 9.5, Air Toxic Emissions from OCC and Recycled Paperboard Stock Preparation, p. 225. VOC is the sum of all compounds. The calculation is: Emission rate (tpy) = Emission Factor (lb/ADTP) * Recycle Pulp Produced (ADTP/yr) / (2,000 lb/ton)

Boise White Paper, LLC
Projected Actual Emission Estimates
J3 High Density Storage Tank

Annual Operating Hours = 8,760 Hours/Year

Compound	Emission Factor		Emission Rate	Notes
	Virgin Kraft		tpy	
VOC	6.35	lb/hr	27.81	1
TRS	0.533	lb/hr	2.33	1
Hydrogen Sulfide	0.0113	lb/hr	0.049	1
1,1,2-Trichloroethane	0.000062	lb/hr	0.00027	1
1,2-Dichloroethylene	7.33E-05	lb/hr	0.00032	1
Acetaldehyde	0.0052	lb/hr	0.023	1
Acetone	0.00845	lb/hr	0.037	1
Alpha-Pinene	4.03	lb/hr	17.65	1
Benzene	1.75E-05	lb/hr	0.000077	1
Chlorobenzene	0.00002	lb/hr	0.000088	1
Chloroform	0.00446	lb/hr	0.020	1
Crotonaldehyde	0.00028	lb/hr	0.0012	1
Dimethyl Disulfide	0.205	lb/hr	0.90	1
Dimethyl Sulfide	0.50	lb/hr	2.19	1
Ethanol	0.0287	lb/hr	0.13	1
Methanol	0.2400	lb/hr	1.05	1
Methyl Ethyl Ketone	0.00621	lb/hr	0.027	1
Methyl Isobutyl Ketone	0.000618	lb/hr	0.0027	1
Methyl Mercaptan	0.00351	lb/hr	0.015	1
n-Hexane	0.000169	lb/hr	0.00074	1
Phenol	0.0517	lb/hr	0.23	1
Propionaldehyde	0.0023	lb/hr	0.010	1
Styrene	0.000267	lb/hr	0.0012	1
Tetrachloroethylene	6.32E-05	lb/hr	0.00028	1
Toluene	0.000204	lb/hr	0.00089	1
Trichloroethylene	6.07E-05	lb/hr	0.00027	1
Xylenes (mixed isomers)	0.000237	lb/hr	0.0010	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.45 and 4.46: Summary of Air Toxic Emissions from High Density Unbleached Pulp Storage Tanks, pp. 84-85. VOC is the sum of volatile organic compounds detected in the study. Emission rate (tpy) = Emission Factor (lb/hr) * Annual Operating Hours (Hours/Yr) / (2,000 lb/ton)

Boise White Paper, LLC

Projected Actual Emission Estimates
New Brown Stock Washer Line

Unbleached Pulp Produced =	800	ADTP/day
Annual Hours HVLC Venting =	87.6	Hours/yr (assumes 1% excess emissions)
Annual Operating Hours =	8,760	Hours/yr

Pollutant	Emission Factor (units)	Emission Rate tpy	Notes
VOC	2.98 lb/ADTP	4.35	1
TRS	0.0549 lb/ADTP	0.080	1
Hydrogen Sulfide	0.00247 lb/ADTP	0.0036	1
1,1,1-Trichloroethane	4.64E-06 lb/ADTP	0.0000068	1
1,1,2-Trichloroethane	4.07E-05 lb/ADTP	0.000059	1
1,2,4-Trichlorobenzene	7.55E-05 lb/ADTP	0.00011	1
1,2-Dichloroethylene	6.68E-06 lb/ADTP	0.000010	1
1,3-Butadiene	9.34E-06 lb/ADTP	0.000014	1
Acetaldehyde	0.0124 lb/ADTP	0.018	1
Acetone	0.041 lb/ADTP	0.060	1
Acetophenone	0.0187 lb/ADTP	0.027	1
Acrolein	2.81E-04 lb/ADTP	0.00041	1
Alpha-Pinene	0.0571 lb/ADTP	0.083	1
Benzaldehyde	0.00094 lb/ADTP	0.0014	1
Benzene	5.04E-05 lb/ADTP	0.000074	1
Biphenyl	1.08E-04 lb/ADTP	0.00016	1
Carbon Disulfide	2.21E-04 lb/ADTP	0.00032	1
Carbon Tetrachloride	1.25E-05 lb/ADTP	0.000018	1
Chlorobenzene	2.43E-05 lb/ADTP	0.000035	1
Chloroform	3.66E-04 lb/ADTP	0.00053	1
Chloromethane	5.62E-05 lb/ADTP	0.000082	1
Cresol (mixed isomers)	0.0216 lb/ADTP	0.032	1
Crotonaldehyde	0.00027 lb/ADTP	0.00039	1
Cyclohexanone	0.000532 lb/ADTP	0.00078	1
Dimethyl Disulfide	0.07 lb/ADTP	0.10	1
Dimethyl Sulfide	0.112 lb/ADTP	0.16	1
Ethanol	0.0119 lb/ADTP	0.017	1
Ethyl Benzene	2.73E-06 lb/ADTP	0.0000040	1
Formaldehyde	0.00162 lb/ADTP	0.0024	1
Isopropanol	0.00114 lb/ADTP	0.0017	1
Limonene	0.0533 lb/ADTP	0.078	1
Methanol	0.60 lb/ADTP	0.88	1
Methylene Chloride	2.08E-04 lb/ADTP	0.00030	1
Methyl Ethyl Ketone	0.00692 lb/ADTP	0.010	1
Methyl Isobutyl Ketone	8.03E-04 lb/ADTP	0.0012	1
Methyl Mercaptan	0.0159 lb/ADTP	0.023	1
Naphthalene	1.41E-05 lb/ADTP	0.000021	1
n-Hexane	1.12E-04 lb/ADTP	0.00016	1
Phenol	0.00153 lb/ADTP	0.0022	1
Propionaldehyde	9.80E-04 lb/ADTP	0.0014	1
Styrene	1.77E-04 lb/ADTP	0.00026	1
Tetrachloroethylene	1.36E-04 lb/ADTP	0.00020	1
Toluene	4.24E-04 lb/ADTP	0.00062	1
Trichloroethylene	5.57E-05 lb/ADTP	0.000081	1
Vinyl Chloride	0.00051 lb/ADTP	0.00074	1
Xylenes (mixed isomers)	2.29E-04 lb/ADTP	0.00033	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.11 and 4.12, Summary of Air Toxic Emissions from Vacuum Drum Type Brownstock Washers, pp. 36-38. VOC is the sum of volatile organic compounds detected in the study. The calculation is:
Emission rate (tpy) = Emission Factor (lb/ADTP) * Unbleached Pulp Produced (ADTP/day) *365 days/yr
* (Hours HVLC Vented / HVLC Operating Hours) / (2,000 lb/ton)

Boise White Paper, LLC
Potential Emission Estimates
Unpaved Road Emissions from PCA Drop Lot

Inputs

Truck with Loaded Trailer Weight (pounds) =	80000
Empty Truck and Trailer Weight (pounds) =	35000
Truck Weight (pounds) =	23000
Trucks Per Day =	50
Operating Schedule (Days/Year) =	365
Round-Trip Distance from Asphalt Road to Trailer Pool (feet) =	1700

TSP Emissions from Unpaved Roads (AP-42, 5th Ed., 11/2006, Sec. 13.2.2, Unpaved Roads)

Trailer Pool	Total Miles (Roundtrip)	Average Vehicle Weight (Tons)	Potential VMT (Miles/Year)	Emission Factor (lb/VMT)	Actual Emissions (lbs/hr)	Roundtrips per Day	Mass Emissions (lb/hr)a	Potential Emissions (TPY)
Unpaved Road Traffic (Gravel)	0.32	20.1	5,876	1.75	1.17	50	1.17	5.14
Total Unpaved Roadway TSP Emissions					**1.17**		**1.17**	**5.14**

Notes:		
1) k, TSP particle size multiplier (k), lb/VMT =	4.9	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
2) a, constant	0.7	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
3) b, constant	0.45	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
4) p, number of days with > 0.01 inches of precipitation	260	Assumes water truck provides wet suppression for 5 days per week and 52 weeks per year
5) road surface silt content (%)	4.8	(AP-42, 5th Edition, 11/2006, Table 13.2.2-1, assume sand and gravel processing plant road)

PM_{10} and $PM_{2.5}$ Emissions from Unpaved Roads (AP-42, 5th Ed., 11/2006, Sec. 13.2.2, Unpaved Roads)

Trailer Pool	Total Miles (Roundtrip)	Avg. Load Per Vehicle (Tons)	Potential VMT (Miles/Year)	Emission Factor (lb/VMT)	Actual Emissions (lbs/hr)	Roundtrips per Day	Mass Emissions (lb/hr)a	Potential Emissions (TPY)
Unpaved Road Traffic (Gravel)	0.32	20.1	5,876	0.45	0.30	50	0.30	1.31
Total Unpaved Roadway PM_{10} Emissions					**0.30**		**0.30**	**1.31**
Total Unpaved Roadway $PM_{2.5}$ Emissions					**0.03**		**0.03**	**0.13**

Notes:		
1) k, PM_{10} particle size multiplier (k), lb/VMT =	1.5	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
2) k, PM-2.5 particle size multiplier (k), lb/VMT =	0.15	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
3) a, constant	0.9	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
4) b, constant	0.45	(AP-42, 5th Edition, 11/2006, Table 13.2.2-2)
5) p, number of days with > 0.01 inches of precipitation	260	Assumes water truck provides wet suppression for 5 days per week and 52 weeks per year
6) road surface silt content (%)	4.8	(AP-42, 5th Edition, 11/2006, table 13.2.2-1, assume sand and gravel processing plant road)

Boise White Paper, LLC
Affected Source Emission Estimates
No. 4 and No. 5 Power Boilers Source Nos. 102-0001-X025 and -X029

Steam Demand Increase = 2,610 million pounds
Boiler Heat Input Increase = 3,689,691 MMBtu
Natural Gas Increase = 3,596 MM scf

Pollutant	Emission Factor (units)	Emission Rate tpy	Notes
Filterable PM	0.00015 lb/MM Btu	0.28	1
Total PM-10	0.00091 lb/MM Btu	1.68	1
Total PM-2.5	0.00081 lb/MM Btu	1.49	1
NO_X	0.050 lb/MM Btu	92.24	3
SO_2	0.6 lb/MM scf	1.08	2
CO	0.090 lb/MM Btu	166.04	3
VOC	0.010 lb/MM Btu	18.45	3
CO_2	116.98 lb/MM Btu	215,816	4
CH_4	0.0022 lb/MM Btu	4.07	4
N_2O	0.00022 lb/MM Btu	0.41	4
CO_2e		216,039	4
Lead	0.0005 lb/MM scf	0.00090	2
1,4-Dichlorobenzene	0.0012 lb/MM scf	0.0022	5
Benzene	0.0021 lb/MM scf	0.0038	5
Formaldehyde	0.075 lb/MM scf	0.13	5
Naphthalene	0.00061 lb/MM scf	0.0011	5
n-Hexane	1.80 lb/MM scf	3.24	5
Toluene	0.0034 lb/MM scf	0.0061	5

Notes:

1 Emission factors for filterable particulate matter, PM-10, and PM-2.5 were obtained from NCASI Technical Bulletin No. 1070, "Evaluation of PM-2.5 Emissions from a Natural Gas-Fired Package Boiler": November 2020; Table 5.2, Natural Gas Combustion Particulate Matter Data for Method 201A and New Method 202, p. 18. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MM Btu) * Boiler Heat Input Increase (MM Btu/yr) / (2,000 lb/ton)

2 Emission factors for sulfur dioxide and lead emissions for natural gas combustion were obtained from AP-42 Table 1.4-2, EMISSION FACTORS FOR CRITERIA AIR AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION, July 1998. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MM scf) * Natural Gas Increase (MM scf) / (2,000 lb/ton)

3 Emission factors for NOx and CO are based on regulatory limits for No. 4 and No. 5 Power Boiler, and the emission factor for VOC is based on the regulatory limit for No. 4 Power Boiler. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MM Btu) * Boiler Heat Input Increase (MM Btu/yr) / (2,000 lb/ton)

4 The emission factors for methane and nitrous oxide are default factors provided by EPA in Table C-2 to 40 CFR Part 98 Subpart C. The calculation is based on Equation A-1 provided by EPA in 40 CFR 98.2(b)(4) where the global warming potential is 1 for CO2, 25 for CH4, and 298 for N2O.
Emission rate (tpy) = Emission Factor (lb/MM Btu) * Boiler Heat Input Increase (MM Btu/yr) / (2,000 lb/ton)
Emission rate (tpy) = CO2 Emissions + (CH4 Emissions x 25) + (N2O Emissions x 298)

5 Emission factors for natural gas were obtained from AP-42 Table 1.4-3, EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION, July 1998.
Emission rate (tpy) = Emission Factor (lb/MM scf) * Natural Gas Input (MM scf) / (2,000 lb/ton)

Boise White Paper, LLC
Affected Source Emission Estimates
Tall Oil Reactor Source No. 401

Tall Oil Production Increase = 12,112.5 Tons

Compound	Emission Factor	Emission Rate tpy	Notes
VOC	4.47 lb/ton	27.07	1
TRS	0.0587 lb/ton	0.36	1
Hydrogen Sulfide	0.0283 lb/ton	0.17	1
1,1,1-Trichloroethane	0.00011 lb/ton	0.00067	1
1,1,2-Trichloroethane	0.0013 lb/ton	0.0079	1
1,2,4-Trichlorobenzene	2.7E-05 lb/ton	0.00016	1
1,2-Dichloroethylene	0.00014 lb/ton	0.00085	1
Acetaldehyde	0.00242 lb/ton	0.015	1
Acetone	0.026 lb/ton	0.16	1
Acrolein	0.00164 lb/ton	0.0099	1
Alpha-Pinene	2.61 lb/ton	15.81	1
Benzene	0.00013 lb/ton	0.00076	1
Carbon Disulfide	0.00222 lb/ton	0.013	1
Chlorobenzene	0.00015 lb/ton	0.00091	1
Chloroform	0.00021 lb/ton	0.00125	1
Chloromethane	0.0306 lb/ton	0.19	1
Cumene	0.0585 lb/ton	0.35	1
Dimethyl Sulfide	0.00481 lb/ton	0.029	1
Ethanol	0.00018 lb/ton	0.0011	1
Methanol	0.0933 lb/ton	0.57	1
Methyl Ethyl Ketone	0.00177 lb/ton	0.0107	1
Methyl Isobutyl Ketone	0.00026 lb/ton	0.0016	1
Methyl Mercaptan	0.0078 lb/ton	0.047	1
n-Hexane	0.00943 lb/ton	0.057	1
Phenol	0.0192 lb/ton	0.116	1
Propionaldehyde	0.00049 lb/ton	0.0030	1
Styrene	0.0011 lb/ton	0.0067	1
Tetrachloroethylene	0.0013 lb/ton	0.0079	1
Toluene	0.0016 lb/ton	0.0097	1
Trichloroethylene	0.00014 lb/ton	0.00087	1
Xylenes (mixed isomers)	0.00119 lb/ton	0.0072	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.65 and 4.66: Summary of Air Toxic Emissions from Tall Oil Reactor Vents, pp. 121-122. VOC is the sum of the volatile organic compounds detected in the study. The calculation is as follows:
Emission rate (tpy) = Emission Factor (lb/ton) * Tall Oil Production (tons) / (2,000 lb/ton)

TSP Emissions from Paved Roads (AP-42, 5th Ed., 1/2011, Sec. 13.2.1, Paved Roads)

Material Handled	Material Throughput Increase (tons)	Total Miles (Roundtrip)	Full Vehicle Weight (Tons)	Unloaded Vehicle Weight (Tons)	Mean Vehicle Weight (Tons)	Potential VMT (Miles/Year)	Emission Factor (lb/VMT)	Roundtrips per Year	Potential Emissions (TPY)
Finished Product	636,046	0.5	33.08	12	22.54	13,715	0.25	30,172	1.70
OCC	456,250	1.0	20.05	12	16.03	56,662	0.18	56,662	4.97

Total Paved Roadway TSP Emissions Increase = 6.67

Notes:

1) k, PM particle size multiplier (k), lb/VMT =	0.011	(AP-42, 5th Edition, 1/2011, Table 13.2.1-1)
2) Road surface silt loading (sL), g/m^2 =	1.02	(AP-42, 5th Edition, 1/2011, Table 13.2.1-3) Assumes same value as PCA-Counce roadway calculator.
3) p, number of days with > 0.01 inches of precipitation	110	(AP-42, 5th Edition, 11/03, Figure 13.2.1-2, 120 days)
4) Number of days in period =	365	

PM_{10} and $PM_{2.5}$ Emissions from Paved Roads (AP-42, 5th Ed., 1/2011, Sec. 13.2.1, Paved Roads)

Material Handled	Material Throughput Increase (tons)	Total Miles (Roundtrip)	Full Vehicle Weight (Tons)	Unloaded Vehicle Weight (Tons)	Mean Vehicle Weight (Tons)	Potential VMT (Miles/Year)	Emission Factor (lb/VMT)	Roundtrips per Year	Potential Emissions (TPY)
Finished Product	636,046	0.5	33.08	12	22.54	13,715	0.05	30,172	0.34
OCC	456,250	1.0	20.05	12	16.03	56,662	0.04	56,662	0.99

Total Paved Roadway PM_{10} Emissions Increase = 1.33

Total Paved Roadway $PM_{2.5}$ Emissions Increase = 0.33

Notes:

1) k, PM10 particle size multiplier (k), lb/VMT =	0.0022	(AP-42, 5th Edition, 1/2011, Table 13.2.1-1)
1) k, PM2.5 particle size multiplier (k), lb/VMT =	0.00054	(AP-42, 5th Edition, 1/2011, Table 13.2.1-1)
2) Road surface silt loading (sL), g/m^2 =	1.02	(AP-42, 5th Edition, 1/2011, Table 13.2.1-3) Assumes same value as PCA-Counce roadway calculator.
3) p, number of days with > 0.01 inches of precipitation	110	(AP-42, 5th Edition, 11/03, Figure 13.2.1-2, 120 days)
4) Number of days in period =	365	

Boise White Paper, LLC
Baseline Emission Estimates
No. 1 Paper Machine   Source No. 102-0001-X026

Paper Produced = 113,484 Machine-Dried Tons
Annual Production = 119,788 Air-Dried Finished Tons (See Note 3)

Compound	Emission Factor		Emission Rate tpy	Notes
Filterable PM	0.039	lb/MDT	2.21	1
Total PM-10	0.055	lb/MDT	3.12	1
Total PM-2.5	0.052	lb/MDT	2.95	1
VOC	0.148	lb/ADTFP	8.86	2
1,2,4-Trichlorobenzene	0.000574	lb/ADTFP	0.034	2
1,2-Dichloroethylene	0.000809	lb/ADTFP	0.048	2
Acetaldehyde	0.00405	lb/ADTFP	0.24	2
Acetone	0.012	lb/ADTFP	0.72	2
Acrolein	0.00238	lb/ADTFP	0.14	2
Alpha-Pinene	0.0284	lb/ADTFP	1.70	2
Benzene	0.000255	lb/ADTFP	0.015	2
Chlorobenzene	0.000244	lb/ADTFP	0.015	2
Chloroform	0.000138	lb/ADTFP	0.0083	2
Ethyl Benzene	4.8E-06	lb/ADTFP	0.00029	2
Formaldehyde	0.0023	lb/ADTFP	0.14	2
Methanol	0.0391	lb/ADTFP	2.34	2
Methylene Chloride	0.000799	lb/ADTFP	0.048	2
Methyl Ethyl Ketone	0.0018	lb/ADTFP	0.11	2
Methyl Isobutyl Ketone	0.00089	lb/ADTFP	0.053	2
Methyl Mercaptan	0.0099	lb/ADTFP	0.59	2
Naphthalene	0.000614	lb/ADTFP	0.037	2
n-Hexane	0.000254	lb/ADTFP	0.015	2
Phenol	0.0115	lb/ADTFP	0.69	2
Propionaldehyde	0.00744	lb/ADTFP	0.45	2
Styrene	0.000267	lb/ADTFP	0.016	2
Tetrachloroethylene	0.00224	lb/ADTFP	0.13	2
Toluene	0.000186	lb/ADTFP	0.011	2
Trichloroethylene	2.97E-07	lb/ADTFP	0.000018	2
Xylenes (mixed isomers)	5.49E-05	lb/ADTFP	0.0033	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column B. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 4.86: Summary of Air Toxic Emissions from Bleached Kraft Paper Machines, pp. 146-147. VOC is the sum of volatile organic compounds detected in the study. The calculation is:
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Annual Production (ADTFP) / (2,000 lb/ton)

3 Machine-dry paper contains 5% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.95 / 0.90

Boise White Paper, LLC
Baseline Emission Estimates
No. 3 Paper Machine — Source No. 102-0001-X027

Paper Produced = 381,971 Machine-Dried Tons
Annual Production = 403,191 Air-Dried Finished Tons (See Note 3)

Compound	Emission Factor		Emission Rate tpy	Notes
Filterable PM	0.039	lb/MDT	7.45	1
Total PM-10	0.055	lb/MDT	10.5	1
Total PM-2.5	0.052	lb/MDT	9.93	1
VOC	0.148	lb/ADTFP	29.8	2
1,2,4-Trichlorobenzene	0.000574	lb/ADTFP	0.12	2
1,2-Dichloroethylene	0.000809	lb/ADTFP	0.16	2
Acetaldehyde	0.00405	lb/ADTFP	0.82	2
Acetone	0.012	lb/ADTFP	2.42	2
Acrolein	0.00238	lb/ADTFP	0.48	2
Alpha-Pinene	0.0284	lb/ADTFP	5.73	2
Benzene	0.000255	lb/ADTFP	0.051	2
Chlorobenzene	0.000244	lb/ADTFP	0.049	2
Chloroform	0.000138	lb/ADTFP	0.028	2
Ethyl Benzene	4.8E-06	lb/ADTFP	0.0010	2
Formaldehyde	0.0023	lb/ADTFP	0.46	2
Methanol	0.0391	lb/ADTFP	7.88	2
Methylene Chloride	0.000799	lb/ADTFP	0.16	2
Methyl Ethyl Ketone	0.0018	lb/ADTFP	0.36	2
Methyl Isobutyl Ketone	0.00089	lb/ADTFP	0.18	2
Methyl Mercaptan	0.0099	lb/ADTFP	2.00	2
Naphthalene	0.000614	lb/ADTFP	0.12	2
n-Hexane	0.000254	lb/ADTFP	0.051	2
Phenol	0.0115	lb/ADTFP	2.32	2
Propionaldehyde	0.00744	lb/ADTFP	1.50	2
Styrene	0.000267	lb/ADTFP	0.054	2
Tetrachloroethylene	0.00224	lb/ADTFP	0.45	2
Toluene	0.000186	lb/ADTFP	0.037	2
Trichloroethylene	2.97E-07	lb/ADTFP	0.000060	2
Xylenes (mixed isomers)	5.49E-05	lb/ADTFP	0.011	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 942, "Measurement of PM, PM-10, PM-2.5 and CPM Emissions from Paper Machine Sources": November 2007; Table F3 Column B. The calculation is:
Emission rate (tpy) = Emission Factor (lb/MDT) * Annual Production (MDT) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 4.86: Summary of Air Toxic Emissions from Bleached Kraft Paper Machines, pp. 146-147. VOC is the sum of volatile organic compounds detected in the study. The calculation is:
Emission rate (tpy) = Emission Factor (lb/ADTFP) * Annual Production (ADTFP) / (2,000 lb/ton)

3 Machine-dry paper contains 5% moisture while air-dry paper contains 10% moisture. Machine-dried production is corrected to air-dried production as follows:
Air-Dried Production = Machine-Dried Production * 0.95 / 0.90

Boise White Paper, LLC
Baseline Emission Estimates
Deink Plant — Source No. 102-0001-X028

Annual Solvent Usage = 130,597 lb/yr
Recycle Pulp Produced = 58,921 ADTP/yr

Pollutant	Emission Factor (units)	Emission Rate tpy	Notes
VOC - Sludge Dewatering	0.25 lb/lb	1.63	1
VOC - Deinking	0.043 lb/ADTP	1.27	2
VOC - Total		2.90	
1,2-Dimethoxyethane	3.46E-05 lb/ADTP	0.00102	2
Acetaldehyde	0.00433 lb/ADTP	0.13	2
Alpha-Pinene	0.000748 lb/ADTP	0.022	2
Biphenyl	0.00206 lb/ADTP	0.061	2
Carbon Disulfide	9.2E-06 lb/ADTP	0.00027	2
Chloroform	0.0156 lb/ADTP	0.46	2
Cumene	2.1E-06 lb/ADTP	0.000063	2
Formaldehyde	0.00004 lb/ADTP	0.0012	2
Methanol	0.00461 lb/ADTP	0.14	2
Methylene Chloride	0.000131 lb/ADTP	0.0039	2
Methyl Ethyl Ketone	0.000593 lb/ADTP	0.017	2
Naphthalene	0.000179 lb/ADTP	0.0053	2
Phenol	0.00334 lb/ADTP	0.098	2
Propionaldehyde	0.00064 lb/ADTP	0.019	2
Styrene	6.4E-05 lb/ADTP	0.0019	2
Toluene	0.0105 lb/ADTP	0.31	2

Notes:

1 VOC emissions from sludge dewatering are based upon actual solvent usage and solvent VOC concentration. The operating permit limits the VOC content of the solvent to 10 percent by weight. The calculation is:
Emission rate (tpy) = Solvent Usage (lb/yr) * VOC Content (0.1 lb/lb) * Emission Factor (lb/lb) / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 9.6, Summary of Air Toxic Emissions from Deinking (with Bleaching) Operations, pp. 226-227. VOC is the sum of all volatile organic compounds.
Emission rate (tpy) = Emission Factor (lb/ADTP) * Recycle Pulp Produced (ADTP/yr) / (2,000 lb/ton)

Boise White Paper, LLC
Baseline Emission Estimates
E-1 Tower Source No. 201-S

Unbleached Pulp Produced = 296,266 ADTP
ODTP Conversion Factor = 0.9 ODTP/ADTP

Compound	Emission Factor		Emission Rate tpy	Notes
CO	0.04	lb/ODTP	5.33	1
VOC	0.028	lb/ODTP	3.73	2
Acetone	0.0005	lb/ODTP	0.067	2
Chlorine Dioxide	0.0006	lb/ADTP	0.089	3
Chloroform	0.00091	lb/ODTP	0.12	2
Methanol	0.027	lb/ODTP	3.60	2
Methyl Ethyl Ketone	0.000068	lb/ODTP	0.0091	2
Styrene	0.000052	lb/ODTP	0.0069	2
Toluene	9.2E-06	lb/ODTP	0.0012	2
Xylenes (mixed isomers)	0.000014	lb/ODTP	0.0019	2

Notes:

1 Emission factor was obtained from NCASI Technical Bulletin No. 1020, "Compilation of Criteria Air Pollutant Emissions Data for Sources at Pulp and Paper Mills Including Boilers": December 2013; Table 4.9. VOC and CO Emissions from Bleach Plant Vents, p. 15 (Mean). The calculation is:
Emission rate (tpy) = Emission Factor (lb/ODTP) * Production (ADTP) * Fraction ODTP/ADTP / (2,000 lb/ton)

2 Emission factors were obtained from NCASI Technical Bulletin No. 679, "Volatile Organic Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants": October, 1994; Table V.E.1 Summary of Emission Test Results Mill E "C Line" Softwood Bleach Plant; pp. 118. E1 Tower (EV11). VOC is the sum of the volatile organic compounds detected in the study. The calculation is:
Emission rate (tpy) = Emission Factor (lb/ODTP) * Production (ADTP) * Fraction ODTP/ADTP / (2,000 lb/ton)

3 Emission rates were compiled from the results of sampling performed by Technical Services, Inc. of Jacksonville, Florida. The sampling was performed on November 11-13, 1993. The emission rates represent the mean values of six (6) sampling runs. Test results indicated that chlorine emissions are below detection limits. The calculation is as follows:
Emission rate (tpy) = Emission Factor (lb/ADTP) * Pulp Production (ADTP) / (2,000 lb/ton)

Boise White Paper, LLC
Baseline Emission Estimates
E-1 Filtrate Tank   Source No. 205-S

Unbleached Pulp Produced = 296,266 ADTP
ODTP Conversion Factor = 0.9 ODTP/ADTP

Compound	Emission Factor		Emission Rate	Notes
			tpy	
VOC	0.0245	lb/ODTP	3.27	2
Acetone	0.0006	lb/ODTP	0.080	2
Alpha-Pinene	6.9E-06	lb/ODTP	0.00092	2
Carbon Tetrachloride	9.60E-05	lb/ODTP	0.013	2
Chlorine Dioxide	0.0025	lb/ADTP	0.37	1
Chlorobenzene	7.7E-06	lb/ODTP	0.0010	2
Methanol	0.024	lb/ODTP	3.20	2
Methyl Ethyl Ketone	4.70E-05	lb/ODTP	0.0063	2
Styrene	7.40E-05	lb/ODTP	0.010	2
Xylenes (mixed isomers)	1.86E-05	lb/ODTP	0.0025	2

Notes:

1. Emission rates were compiled from the results of sampling performed by Technical Services, Inc. of Jacksonville, Florida. The sampling was performed on November 11-13, 1993. The emission rates represent the mean values of six (6) sampling runs. Test results indicated that chlorine emissions are below detection limits.
   The calculation is as follows:
   Emission rate (tpy) = Emission Factor (lb/ADTP) * Pulp Production (ADTP) / (2,000 lb/ton)

2. Emission factors were obtained from NCASI Technical Bulletin No. 679, "Volatile Organic Emissions from Pulp and Paper Mill Sources, Part V - Kraft Mill Bleach Plants": October, 1994; Table V.E.2 Summary of Emission Test Results Mill E "C Line" Softwood Bleach Plant; pp. 119. E1 Seal Tank (EV16).
   VOC is the sum of the volatile organic compounds detected in the study. The calculation is:
   Emission rate (tpy) = Emission Factor (lb/ODTP) * Production (ADTP) * Fraction ODTP/ADTP / (2,000 lb/ton)

Boise White Paper, LLC
Baseline Emission Estimates
Combined Scrubber — Source No. 102-0001-S445

Bleached Pulp Produced = 266,639 ADTBP
Bleach Plant Operating Hours = 8,545 hours/yr

Compound	Emission Factor	Emission Rate tpy	Notes
Filterable PM	1.5 lb/hr	6.41	1
Condensable PM	0.16 lb/lb PM	1.03	1
Filterable PM-10	0.953 lb/lb PM	6.11	1
Total PM-10		7.13	
Filterable PM-2.5	0.852 lb/lb PM	5.46	1
Total PM-2.5		6.49	
CO	42.1 lb/hr	179.9	2
VOC	0.146 lb/ADTBP	19.5	3
TRS	0.0102 lb/ADTBP	1.36	3
1,1,2-Trichloroethane	6.85E-06 lb/ADTBP	0.00091	3
1,2,4-Trichlorobenzene	0.000155 lb/ADTBP	0.021	3
1,3-Butadiene	4.91E-05 lb/ADTBP	0.0065	3
1,2-Dichloroethylene	3.51E-06 lb/ADTBP	0.00047	3
Acetaldehyde	0.00168 lb/ADTBP	0.22	3
Acetone	0.0037 lb/ADTBP	0.49	3
Acrolein	2.90E-05 lb/ADTBP	0.0039	3
Alpha-Pinene	7.30E-04 lb/ADTBP	0.097	3
Benzene	4.08E-05 lb/ADTBP	0.0054	3
Carbon Tetrachloride	5.06E-06 lb/ADTBP	0.00067	3
Chlorine	0.000 lb/hr	0.00	4
Chlorine Dioxide	0.000 lb/hr	0.00	4
Chlorobenzene	8.01E-06 lb/ADTBP	0.0011	3
Chloroform	0.005 lb/ADTBP	0.67	3
Cumene	0.000219 lb/ADTBP	0.029	3
Dimethyl Sulfide	0.00124 lb/ADTBP	0.17	3
Ethanol	0.00256 lb/ADTBP	0.34	3
Ethyl Benzene	1.90E-05 lb/ADTBP	0.0025	3
Formaldehyde	5.13E-04 lb/ADTBP	0.068	3
Hydrochloric Acid	0.0195 lb/ADTBP	2.60	3
Methanol	0.12 lb/ADTBP	16.0	3
Methylene chloride	9.61E-05 lb/ADTBP	0.013	3
Methyl ethyl ketone	6.81E-04 lb/ADTBP	0.091	3
Methyl isobutyl ketone	0.000251 lb/ADTBP	0.033	3
Methyl mercaptan	9.80E-04 lb/ADTBP	0.13	3
n-Hexane	2.35E-05 lb/ADTBP	0.0031	3
Phenol	0.00341 lb/ADTBP	0.45	3
Propionaldehyde	0.00052 lb/ADTBP	0.069	3
Styrene	8.19E-05 lb/ADTBP	0.011	3
Toluene	9.58E-05 lb/ADTBP	0.013	3
Trichloroethylene	0.000012 lb/ADTBP	0.0016	3
Xylenes (mixed isomers)	2.22E-05 lb/ADTBP	0.0030	3

Notes:

1 Emission estimate based on filterable PM source test performed on September 5, 1996. PM-10 and PM-2.5 are estimated from filterable PM using fractions reported in AP-42 Table 10.2-6 (January 1995) for particle-size distribution in packed tower scrubbers. CPM is estimated using the factor for lime kilns equipped with wet scrubber systems in Table 4.13 of NCASI Technical Bulletin 1020 (December 2013). The calculation is: Emission rate (tpy) = Test rate (lb/hr) * Hours (hr/yr) / (2,000/ton)

2 Emission estimate based on CO source test performed on September 5, 1996. The calculation is as follows:
Emission rate (tpy) = Test rate (lb/hr) * Hours (hr/yr) / (2,000/ton)

3 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Tables 4.1, 4.2 and 4.4: Summary of Air Toxic Emissions from Kraft Mill Bleach Plants, pp. 22-25. VOC is the sum of volatile organic compounds detected in the study. The emission calculation is as follows:
Emission rate (tpy) = Factor (lb/ADTBP) * Bleached Pulp Produced (ADTBP) / (2,000 lb/ton)

4 Emission rates were compiled from the results of sampling performed by Sanders Engineering of Mobile, Alabama. The sampling was performed on March 16, 2011. The emission rates represent the mean values of three (3) sampling runs. The calculation is as follows:
Emission rate (tpy) = Test rate (lb/hr) * Hours (hr/yr) / (2,000/ton)

Boise White Paper, LLC
Baseline Emission Estimates
ClO_2 Generator Tail Gas Scrubber Source No. 102-0001-X014

ClO_2 Production = 8,909 tons of ClO_2
Bleach Plant Operating Hours = 8,545 hours/yr

Compound	Emission Factor		Emission Rate tpy	Notes
VOC	0.0617	lb/ton ClO_2	0.27	1
Acetaldehyde	0.00388	lb/ton ClO_2	0.017	1
Alpha-Pinene	0.0073	lb/ton ClO_2	0.033	1
Benzene	0.000112	lb/ton ClO_2	0.00050	1
Chlorine	0.0094	lb/hr	0.040	2
Chlorine dioxide	0.026	lb/hr	0.11	2
Chlorobenzene	7.07E-05	lb/ton ClO_2	0.00031	1
Chloroform	0.00774	lb/ton ClO_2	0.034	1
Formaldehyde	0.0012	lb/ton ClO_2	0.0053	1
Methanol	0.015	lb/ton ClO_2	0.067	1
Methylene chloride	0.00049	lb/ton ClO_2	0.0022	1
Phenol	0.00337	lb/ton ClO_2	0.015	1
Styrene	0.00016	lb/ton ClO_2	0.00072	1
Xylenes (mixed isomers)	0.00014	lb/ton ClO_2	0.00061	1

Notes:

1 Emission factors were obtained from NCASI Technical Bulletin No. 1050, "Compilation of Air Toxic Emissions Data for Pulp and Paper Mill Sources": September 2018; Table 4.89: Summary of Air Toxic Emissions from ClO2 Generator Scrubber Vents, pp. 151-152. VOC is the sum of the volatile organic compounds detected in the study. The calculation is as follows:
Emission rate (tpy) = Emission Factor (lb/ton ClO2) * Annual Production (tons ClO2) / (2,000 lb/ton)

2 The emission factors for chlorine and chlorine dioxide are based on results from emission tests performed on June 28, 2013. The calculation is as follows:
Emission rate (tpy) = Test rate (lb/hr) * Hours (hr/yr) / (2,000/ton)

Boise White Paper, LLC

Baseline Emission Estimates

Methanol Storage Tank

Source No. 102-0001-X015

Compound	Emission Factor lb/ton	Emission Rate lb/yr	Emission Rate ton/yr	Notes	Permit Limits lb/hr	Federally Enforceable Limits?
Methanol	N/A	867	0.43	1	NSPS*	Yes

Notes:

* Methanol Tank is subject to NSPS requirements under 40 CFR 60 Subpart Kb.

1 The methanol emission rate is based on the following calculations:

Liquid Organic Storage Calculations (AP-42) **Boise White Paper, LLC** **Jackson, Alabama**			
Breathing Losses			
Lb = 2.26E-2 x Mv x (P/(Pa - P))^0.68 x D^1.73 x H^0.51 x Delta T^0.5 x Fp x C x Kc			
Where:	Are:	Units	
			Methanol Tank
Mv	Molecular weight of vapor in storage tank	lb/lb-mole	32
P	True vapor pressure at bulk liquid conditions	psia	2.43
Pa	Average atmospheric pressure at tank location	psia	14.696
D	Tank diameter	feet	9.51
H	Average vapor space height	feet	8
Delta T	Average ambient diurnal temperature change	° F	24
Fp	Paint factor		1.39
C	Adjustment factor for small diameter tanks		0.5
Kc	Product factor		1
Lb	Fixed roof breathing loss	lb/yr	116.4
Working Losses			
Lw = 2.40E-5 x Mv x P x V x N x Kn x Kc			
Where:	Are:	Units	
			Methanol Tank
Mv	Molecular weight of vapor in storage tank	lb/lb-mole	32
P	True vapor pressure at bulk liquid conditions	psia	2.43
V	Tank Capacity	gallons	17,000
N	Number of turnovers/year		23.64
	Throughput/year	gallons	401,932
Kn	Turnover factor		1
Kc	Product factor		1
Lw	Fixed roof working losses	lb/yr	750.1
Control Efficiency			
Elw	Efficiency for loading	%	0
Elb	Efficiency for normal operation	%	0
Total Fixed Roof Losses			
Lt = ((1 - Elw) x Lw + (1 - Elb) x Lb)			
Lt	**Total Losses**	**lb/yr**	**867**
Lt	**Total Losses**	**tpy**	**0.43**

APPENDIX C

Modeled Emissions of Precursors Analysis

Ambient Air Quality Assessment

Paper Machine Conversion Project

Boise White Paper, LLC dba PCA Jackson

December 2020

Submitted by:

Boise White Paper, LLC
Jackson Mill
4585 Industrial Road
Jackson, Alabama

Submitted to:

Alabama Department of Environmental Management
Air Division
1400 Coliseum Boulevard
P.O. Box 301463
Montgomery, AL 36110-2400

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LIST OF FIGURES

1. INTRODUCTION

Boise White Paper, LLC (Boise White) owns and operates a Kraft pulp and paper mill in Jackson, Alabama (Jackson Mill or Mill). The Mill is a major source as defined by the Federal operating permit program (40 CFR Part 70) and the Federal New Source Review (NSR) program (40 CFR Part 52). In addition, the Mill is subject to the Alabama Department of Environmental Management (ADEM) Title V Operating Permit (TVOP) regulations and NSR regulations per Alabama Admin. Code (AAC) 335-3-16 and AAC 335-3-14, respectively.

The Mill is proposing to modify the existing No. 1 and No. 3 Paper Machines to add the capability to manufacture a different product, to modify the existing Deink Plant, install a new Recycled Fiber Plant, install a new Brownstock Washer Line, and shutdown the Bleach Plant. The Tall Oil Reactor and No. 4 and No. 5 Power Boilers will also be affected by the project due to increased utilization attributable to the project. The proposed project will result in a net significant emissions increase in Volatile Organic Compounds (VOC) and Greenhouse Gases (GHG) as determined under ADEM's Prevention of Significant Deterioration (PSD) permitting regulations, Chapter 335-3-14-.04.

When a net significant emissions increase is projected to occur, ADEM's PSD regulations require an applicant to perform an ambient impact assessment to demonstrate that the proposed project will not:

- Exceed any National Ambient Air Quality Standard (NAAQS) at any location during any time; and
- Will not cause any allowable PSD increment to be exceeded.

There are no NAAQS or PSD increments for VOC. Therefore, an air quality modeling assessment was not required. However, VOC emissions increases have been evaluated in terms of precursor impacts on secondary formation of ozone in Class II areas. There are no air quality modeling requirements for GHG; therefore, they are not covered in this report. Boise White has prepared this ambient air quality assessment in accordance with the protocol submitted to ADEM on 22

December 2020 and approved by ADEM via email on 29 December 2020. Additional sections of this ambient air quality assessment contain the following information:

- **Section 2 – Mill and Project Overview** – provides an overview of the Mill's current configuration and operations, as well as a description of the proposed project.
- **Section 3 – Secondary Pollutant Formation** – describes the methodology and analysis performed to assess secondary formation of ozone as a result of project emissions of VOC.
- **Section 4 – Post-Construction Monitoring** – includes justification that no post-construction ozone monitoring is required.
- **Section 5 – Additional Impacts Analysis** – contains the growth analysis and soils and vegetation impact analysis as required by the PSD program.
- **Section 6 – References** – provides a detailed list of the reference documents utilized for the air quality assessment.

2. MILL AND PROJECT OVERVIEW

The following subsections include background information on the Jackson Mill and the proposed project.

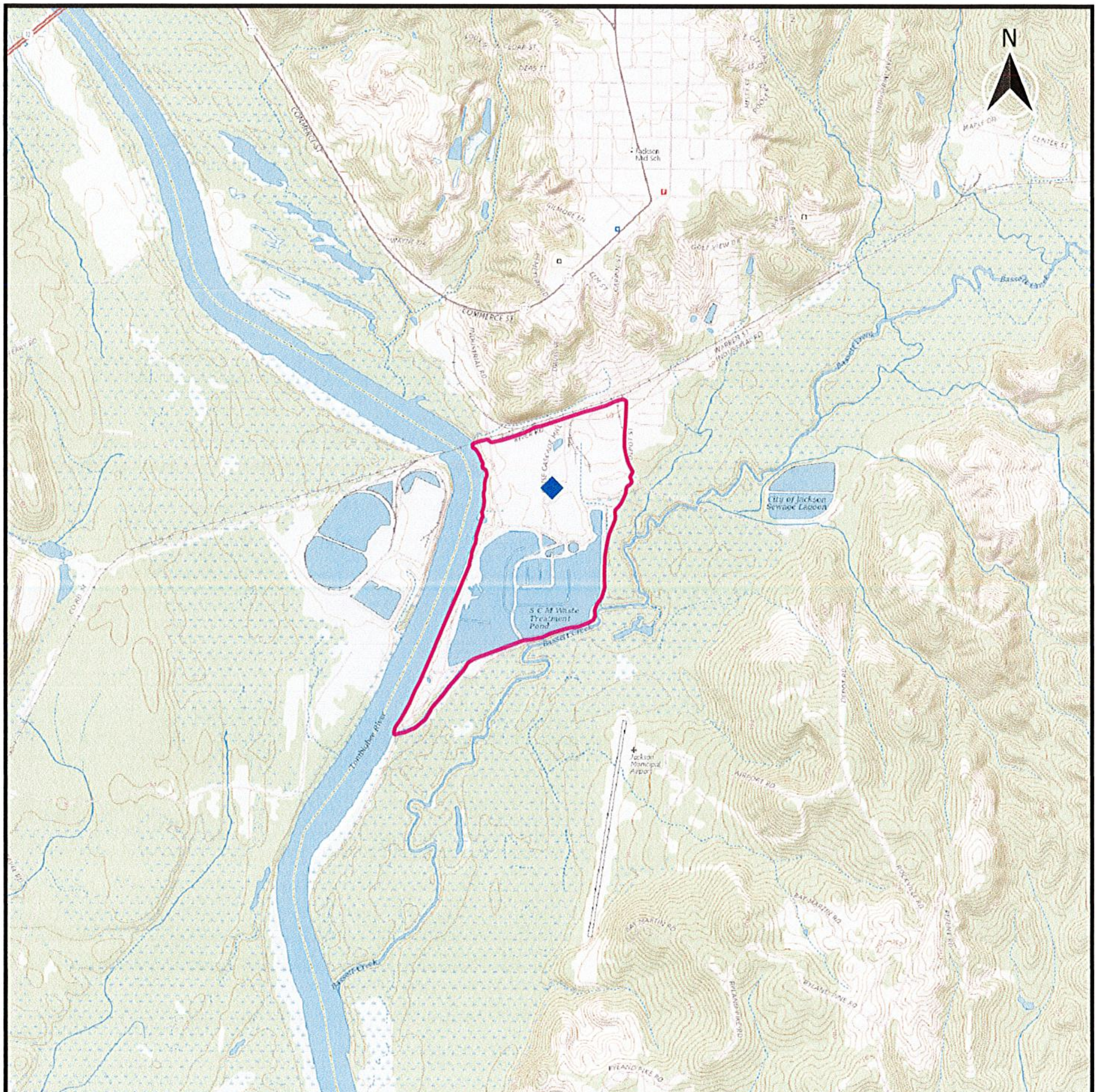
2.1 MILL LOCATION

The Mill is located south of Jackson, Clarke County, Alabama. A Mill location map is provided in Figure 2-1. The geographical coordinates for the approximate center of the processing area of the Mill are:

- Universal Transverse Mercator (UTM) Easting: 414,616 meters (m)
- UTM Northing: 3,484,510 m
- UTM Zone: 16
- North American Datum (NAD): 1983
- Longitude (degrees, minutes, seconds): 87° 53' 56.49" W
- Latitude (degrees, minutes, seconds): 31° 29' 32.18" N

The Mill is in the Alabama and Tombigbee Rivers Intrastate Air Quality Control Region (AQCR) (as designated in 40 CFR §81.266). Within this AQCR, Clarke County is in attainment or unclassifiable with respect to the NAAQS for all NAAQS pollutants (as designated in 40 CFR §81.301) as of the date of this submittal.

The area surrounding the Mill includes generally flat terrain with only moderate changes in elevation. The Mill elevation is 45 ft. above mean sea level (amsl). The elevations for the surrounding topography were obtained from United States Geological Survey (USGS) National Elevation Dataset (NED) files.



◆ Boise White Paper, LLC (PCA Jackson)

▭ Approx. Facility Boundary

0 0.75 1.5 2.25 3 km

Figure 1
Facility Location Map

Boise White Paper, LLC (PCA Jackson)
Jackson, AL

2.2 MILL PROCESS DESCRIPTION

The Jackson Mill consists of the woodyard, pulp mill, recycle plant, bleach plant, paper machines, recausticizing operations, utilities, tall oil plant, and other miscellaneous operations. The papermaking process begins in the woodyard area where logs are debarked and chipped. The wood chips are reclaimed from chip storage piles and fed into the batch digesters to produce pulp. The pulp slurry from the digesters is screened, washed, and thickened prior to being sent to the bleach plants. Pulp is transferred to the two paper machines where it is further processed into multiple types of uncoated freesheet paper for sale in rolls. The following subsections further describe the current Mill operations for the emissions units that will be modified or affected as a result of the proposed project.

2.2.1 Recycle (Deink) Plant

In addition to the virgin pulp papermaking process described in Section 2.2.2, the Mill also uses recycled paper in the papermaking process. Post-consumer recycled paper is repulped, deinked with proprietary chemicals, cleaned, and bleached to produce paper making fiber. The post-consumer recycled paper is added to a set of hydrapulpers (Source No. X028). The pulp slurry exiting the hydrapulpers is either sent directly to the papermaking operations area, or screened, washed, and bleached. As part of the deinking operations, the Mill adds a dry additive for the purposes of deinking the pulp slurry.

2.2.2 Nos. 1 and 3 Paper Machines

Bleached virgin and deinked recycled pulp is refined, cleaned, and combined with wet end additives prior to being diluted at the headbox of the paper machines. The low consistency slurry is then applied to the wire, where it forms the sheet. Water drains by vacuum into a pit, while the wet sheet travels to the press and dryer sections to remove the remaining water. At this stage, the partially dried pulp is combined with dry end additives. All water that is mechanically removed from the pulp (called white water) is refined to recover fiber and then recycled within the Mill or sent to the wastewater treatment system. The paper that is produced on the Nos. 1 and 3 Paper Machines (PM1 and PM3) is then cut and packaged for sale in a finishing and shipping operation.

2.2.3 Nos. 4 and 5 Power Boilers

Two natural gas-fired power boilers provide steam for Mill production processes, including PM1 and PM3. The No. 4 Power Boiler (Source No. X025) is a 346.4 million British thermal units per hour (MMBtu/hr) boiler permitted to burn natural gas. The No. 5 Power Boiler (Source No. X029) is also a 346.4 MMBtu/hr boiler permitted to burn natural gas.

2.2.4 Tall Oil Reactor

Tall oil is produced from soap concentrated by the black liquor evaporation process. In the evaporators, soaps, which result from the rosins and fatty acids in the wood chips that are released in the cooking process are collected. When the black liquor is concentrated in the evaporators, the soap becomes insoluble and separates from the liquor. The soap is skimmed off and converted into tall oil in a batch reactor (Source No. 401) by mixing it with sulfuric acid. The crude tall oil is sold for further processing.

2.3 PROPOSED PROJECT DESCRIPTION

The proposed project involves the modification of the existing PM1, PM3, and Recycled Fiber (Deink) Plant emissions units and the installation of a New Recycled Fiber Plant emissions unit and New Brownstock Washer Line. PM1 and PM3 are currently used to produce a bleached paper. After the proposed modifications, PM1 will be used to produce 600 machined dried tons per day (MDT/day) of corrugated medium and/or unbleached Kraft paper from a mixture of virgin kraft and recycled pulp furnish. PM3 will produce 2,500 MDT/day of brown linerboard from a mixture of virgin kraft plus recycled pulp furnish.

The Mill is not proposing to make any modifications to the digesters or alter the current virgin fiber cooking process. The Mill will supply unbleached virgin fiber stock to PM1 and PM3 by bypassing the bleach plant. Therefore, the proposed project will not debottleneck any upstream or downstream emissions units. In addition, at the time of this application submittal, there are no anticipated increases to effluent at the Mill's wastewater treatment plant (WWTP) or anticipated emissions increases associated with the WWTP as a result of the proposed project. Therefore, the WWTP is considered not affected.

Any increase in steam demand from the proposed project will be produced by the Nos. 4 and 5 Power Boilers. Based on information provided by ADEM during a December 21, 2020 conference call, and per ADEM's guidance the Nos. 4 and 5 Power Boilers were not included in the PSD applicability analysis since the Mill is not requesting an increase to current permitted emissions rates and the Nos. 4 and 5 Power Boilers have previously been included in a PSD permitting evaluation. The Tall Oil Reactor (Source No. 403) was be considered an affected emissions unit for the project due to increased softwood chip utilization (in lieu of hardwood chips) directly attributable to the project.

3. SECONDARY POLLUTANT FORMATION

The May 2017 revisions to the 40 CFR Part 51 Appendix W Guidelines on Air Quality Models included a provision that requires major stationary sources subject to NSR/PSD review to assess a project's impacts on the formation of ozone and secondary particulate matter with a diameter less than 2.5 microns ($PM_{2.5}$). U. S. EPA provides a two-tiered approach for assessing the impacts of emissions for these pollutants:

- Tier 1 involves using known relationships between precursor emissions and a source's impacts to qualitatively assess the potential for secondary $PM_{2.5}$ and ozone formation.
- Tier 2 involves a more detailed analysis and could involve application of a photochemical grid model to determine the secondary $PM_{2.5}$ and ozone impacts.

U. S. EPA has published guidance to establish Significant Impact Levels (SILs) for ozone and $PM_{2.5}$ and also established Modeled Emission Rates for Precursors (MERP) as a Tier-1 demonstration tool. A MERP represents a level of precursor emissions that is not expected to contribute significantly to concentrations of ozone or secondarily formed $PM_{2.5}$. Emissions in excess of the MERPs would require an alternative Tier-1 approach or potentially a Tier-2 analysis.

The final MERPs guidance "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" finalized April 30, 2019 (U.S. EPA 2019) contains photochemical model results generated by U.S. EPA representing maximum downwind ozone and $PM_{2.5}$ concentrations due to emissions of hypothetical sources of precursor emissions [nitrogen oxide (NO_X) and volatile organic compounds (VOC) for ozone, NO_X and sulfur dioxide (SO_2) for $PM_{2.5}$]. The MERPs guidance contains a procedure to calculate applicable precursor emissions that would be assumed to result in significant concentrations of ozone or $PM_{2.5}$.

As specified in Table 3-1 in Section 3 of the Boise White PM Modification Application, the potential emissions of VOC from the proposed project are 404.4 tons per year (tpy). Because this emission rate is above the Prevention of Significant Deterioration (PSD) Significant Emission Rate (SER) for VOC of 40 tons, an analysis of potential impacts from VOC emissions from the project on ambient ozone is required. The project emissions of NO_X are below the PSD SER of 40 tons per year and do not trigger PSD review for NO_X. Therefore, per U.S. EPA guidance, only VOC emissions from the project were included in the ozone MERPs analysis.

U.S. EPA guidance Table 4-1 on page 43 of the guidance document, shows the lowest, median, and highest MERPs, in tons per year (tpy), for each of the 9 Climate Zones in the United States. Figure 3-4 on page 23 of the guidance shows that Alabama, where the project is located, is in the Southeast Climate Zone. To be conservative, Boise White Papers selected the lowest MERP value for VOC in the Southeast Climate Zone for 8-hour ozone, 1,936 tpy. The VOC emissions from the project were determined to be only 21% of the MERPs:

404.7 / 1,936 = 0.209

As the VOC emissions from the project are well below the worst case MERP for the Southeast Climate Zone, the project is not expected to adversely impact ambient ozone concentrations, and therefore no further evaluation is necessary.

As neither precursor associated with the secondary formation of $PM_{2.5}$, SO_2 or NO_X, exceeded their respective SER's, no evaluation of the secondary formation of $PM_{2.5}$ is required for this project.

4. POST-CONSTRUCTION MONITORING

Per Chapter 335-3-14-.04(12)(b), the owner or operator of a major modification shall, after construction of the modification, conduct such ambient monitoring as the Director determines is necessary to determine the impact for said modification that may have, or is having, on air quality in any area. The proposed project is considered a major modification for VOC. VOC is a precursor for ozone, so the Mill is potentially subject to the post-construction monitoring requirements for ozone. However, the Mill proposes that post-construction monitoring for ozone will not be necessary for the proposed project because of the close proximity of the Chickasaw Ozone Monitoring Station (Chickasaw), ambient monitoring station. The Chickasaw ozone ambient monitoring station is located 81 km to the south of the Mill and is the closest ozone monitor to the Mill. The Chickasaw monitor objective is population exposure.

5. ADDITIONAL IMPACTS ANALYSIS

A discussion of the impacts of the proposed project on the area surrounding the Mill is provided below. As part of this discussion, the potential growth resulting from the proposed project is estimated. Additionally, impacts on soil and vegetation are qualitatively addressed below. Visibility impacts were not addressed as the proposed project is not major for primary particulate matter emissions or precursors to secondary particulate formation that would be responsible for visibility impairment.

5.1 GROWTH ANALYSIS

It is anticipated that the proposed project will have insignificant impacts on secondary source growth in the area of the city of Jackson in Clarke County. The proposed project is expected to employ less than 25 additional employees upon completion of construction, with some additional temporary workers during the construction period. According to 2019 U.S. Census Bureau estimates, the population of Clarke County is about 24,000 persons, and nearby Washington County has a population of 16,000 persons. Adequate short-term housing and other services are available in the immediate vicinity of the proposed project to accommodate any temporary additional work force required. In particular, the Mill already increases temporary workers on an annual basis during their shutdown period, and the additional temporary workforce is easily accommodated in the region. Any permanent new employees, even if all were to be new residents of the immediate area, would have little impact on the need for housing and related commercial services. According to the U.S. Census Bureau there are about 12,900 housing units in Clarke County, and 8,600 housing units in nearby Washington County. These figures show that adequate existing housing, transportation and other services are present in the local area to absorb any new full-time staff required to accomodate the proposed changes to the facility.

No significant impact is expected on roadways used for construction or operation of the proposed project due to the existing nature of the transportation system in the vicinity of the proposed project. The roads in the vicinity of the proposed project are well constructed to accommodate the traffic related to the construction and operation of the proposed project.

For these reasons, no significant air quality impacts due to secondary source growth are anticipated during the construction or operational phase of the proposed project.

5.2 ADVERSE IMPACTS ON VEGETATION

Vegetation can be impacted from the emission of excessive amounts of common atmospheric pollutants such as SO_2, NO_X, CO, carbon dioxide (CO_2), hydrogen fluoride (HF), ozone, hydrocarbons, particulates and metals[1] (Malhotra and Khan, 1984). In general, however, the main atmospheric pollutants that affect vegetation are nitrogen-based, sulfur-based, and ozone-based, with ozone causing more damage to plants than all other air pollutants combined[2]. The sensitivity of vegetation to atmospheric pollution varies greatly with such factors as plant species and variety, climatic and seasonal conditions, soil composition, the concentration and duration of exposure, and the nature of combinations of pollutants[3] [4].

A summary of research on air pollution effects on vegetation divides air pollution injuries to plants into three general categories: acute, chronic, and subtle[3]. Acute injury is caused by exposure to a high concentration of a substance resulting in rapid visible death of some tissue. Chronic injury is caused by long-term exposure to low pollutant levels which gradually disrupts physiological processes and retards growth or yield[5]. The subtle effects of air pollution on vegetation are difficult to quantify since the threshold concentrations and exposure times that may cause subtle

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[1] S.S. Malhotra and A.A. Khan – "Physiology and Mechanisms of Airborne Pollutant Injury to Vegetation" Northern Forest Research Centre Canadian Forestry Service, December 1980.

[2] Burkey, Kent O. – "Effects of Ozone on Apoplast/Cytoplasm Partitioning of Ascorbic Acid in Snap Bean" U.S. Department of Agriculture, Agricultural Research Service and Department of Crop Science and Botany, North Carolina State University, Raleigh, NC, April 29, 1999.

[3] Treshow, Michael – "Air Pollution and Plant Life" Environmental Monographs and Symposia, 1984.

[4] Whitmore, M.E. – "Relationships between dose of SO_2 and NO_2 mixtures and growth of Poa prantensis" New Phytol 99, 1985.

[5] Slinn, W.G. et al. – "Some Aspects of the Transfer of Atmospheric Trace Constituents Past the Air-Sea Interface" Atmosphere and Environment, 1978.

damage are difficult to define. The Mill has specifically addressed VOC and CO_2 emissions as the PSD-triggering pollutants for the proposed project.

Potential damage to vegetation in the area surrounding the Mill from VOC is unlikely. In general, acute damage to vegetation is not likely to occur at ambient air concentration levels below the 8-hour ozone NAAQS. As discussed in the Section 3, ozone impacts from the proposed project will not result in an increase to the critical air quality threshold of 1.0 part per billion, which is based on the ozone SIL. Therefore, adverse effects on vegetation from VOC emissions are not expected to occur.

6. REFERENCES

ADEM 2020 – "DRAFT PSD Air Quality Analysis AERMOD Modeling Guidelines", ADEM Air Division Planning Branch, Meteorological Section, 2008.

Boise White 2020 – "Ambient Air Quality Assessment Protocol", Boise White Paper, LLC DBA PCA Jackson

U.S. EPA 2020 – "DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling." U.S. Environmental Protection Agency Office of Air Quality Planning and Standards, Air Quality Assessment Division, Research Triangle Park, NC, February 2020.

U.S. EPA 2019 – "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". U.S. Environmental Protection Agency Office of Air Quality Planning and Standards, Air Quality Assessment Division, Research Triangle Park, NC, April 2019.

U.S. EPA 2017 – 40 CFR Part 51 Appendix W "Guideline on Air Quality Models (Revised) January 2017.